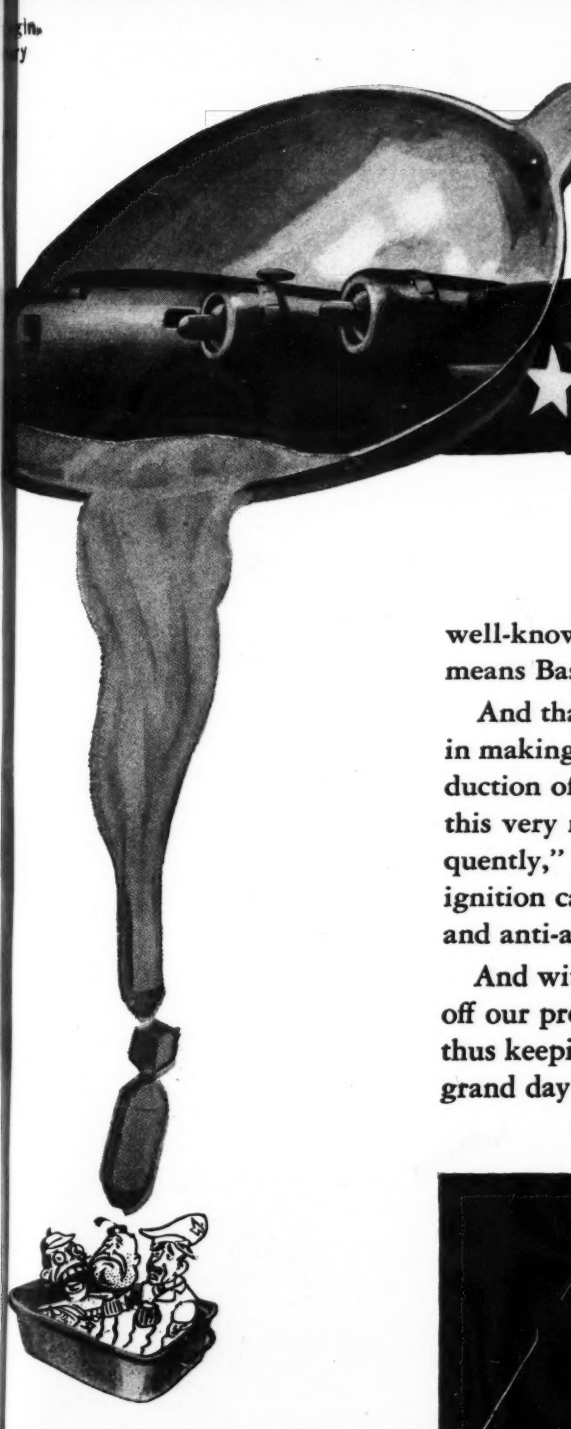
GAS

ENGINEERING • UTILIZATION • LOAD-BUILDING • MANAGEMENT

JUN 24 1943



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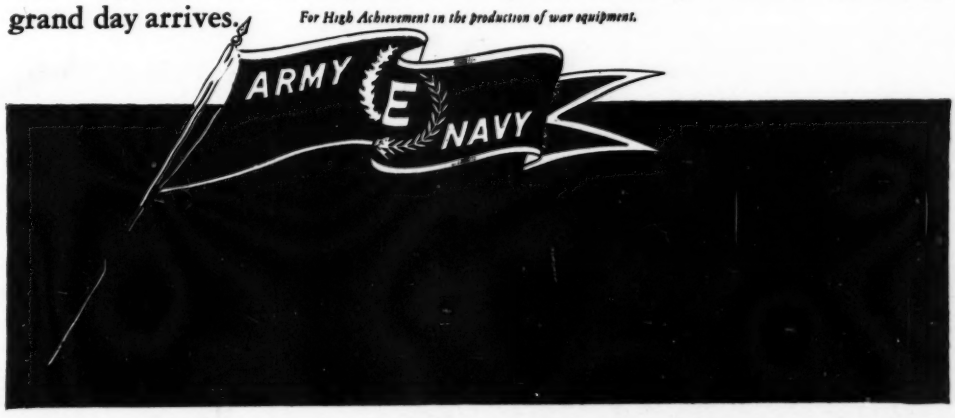

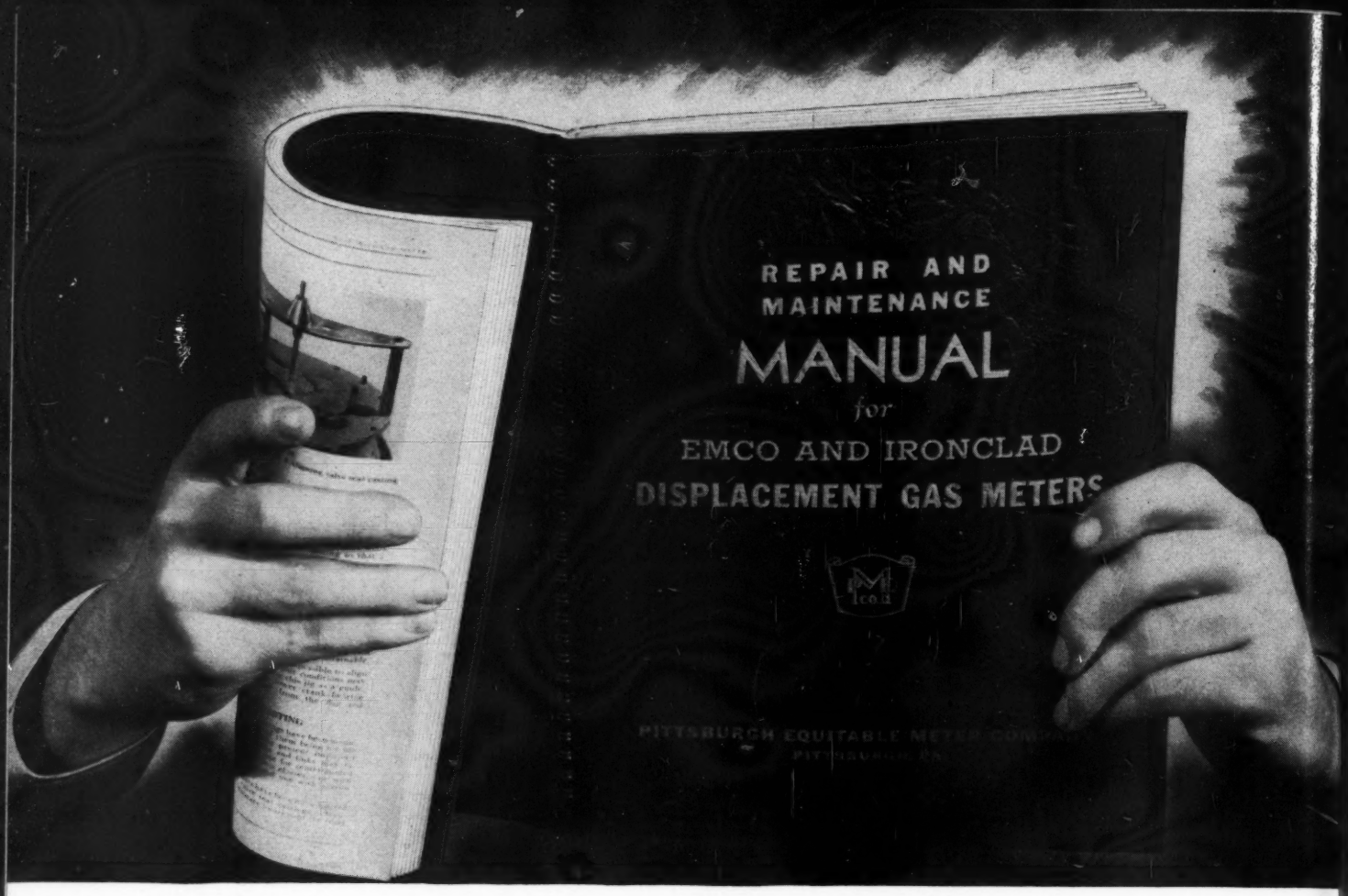

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GAS

REG. U. S. PATENT OFFICE

Nineteenth Year of Publication

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WE'LL ALWAYS NEED GAS

By C. GEORGE SEGELER

Utilization Engineer, American Gas Association *

GAS plays a part in the every-day life of the community, in its wholesale production of food, clothing, shelter, and in its industrial operations of every kind. Most of these uses for gas are indispensable. They are uses for which no substitute exists. In many cases, moreover, they are uses which will expand in the post-war period, because they make possible the production of some of the new miracle materials about which we are hearing.

• •

The sharp upward pitch of the commercial and industrial gas sales in both the manufactured and natural gas fields has been almost constant since depression years. This is so long a period that it clearly is not due to the impetus of war industry. This is no "war baby" growth, although the 1941-1942 expansion has, of course, exclusively been due to increases in commercial and industrial gas sales for war materials. That fact does not change the basic significance that commerce and industry made use of gas as a source of heat in increasing amounts every year. Moreover, the rate of growth was approximately constant, amounting to 12% per year.

• •

No other fuel offers the means of control of temperature and atmosphere which gas can offer. As a matter of fact, even when extravagant claims are made for competitive furnaces which, in some cases, use electricity, it is always necessary to burn gas to provide the atmospheric protection which modern production must have in order that the finished product will have the strength and the surface condition demanded.

For the post-war period, the gas industry will be in a position to market units that will carry out these four functions:

1. Temperature control
2. Air motion control
3. Humidity control, and
4. Filtration

This will be done with moderate-cost, single-package units. Several hundreds of these are already installed, and sufficient experience has been gathered on their performance characteristics to demonstrate that they are satisfactory units for both home and small store use. Financial data have been collected as well, and the opinion of several gas companies is to the effect that a 5% saturation of homes with equipment of this type will double the net income of the average gas company.

As for costs, they are hard to predict in the middle of a war. Somewhere between $300 and $400 per ton of refrigeration is the present price, but this is based on a limited production under conditions prevailing in 1941. An average house might require from two to three and one-half tons of refrigeration capacity. But this unit must not be regarded as a summer proposition. It is the self-same piece of apparatus which will heat the house in the winter. In a sense, it is a combination of summer air conditioner plus winter heating furnace plus other advantages and features. In short, the installed cost cannot be reckoned as though it were merely an added summer air conditioner.

• •

Mention has also been made of the inroads of electric competition on the fundamental base load of the gas industry—the gas range load. Until the figures of the U. S. census of 1940 were released, information on this vital topic had largely been derived from two sources:

1. Of a statistical nature, emanating from the electric industry.
2. From public opinion surveys which often contained an element of wishful thinking on the part of the public canvassed.

Such surveys went as far back as 1921 and purported to show, even at that early date, a public demand for electric ranges. But a true appraisal of the situation requires a somewhat more realistic approach.

Speaking of the country as a whole, it is a little disputed fact that the electric range has made little inroad into homes *already using gas for cooking.* The major portion of electric range sales has been in areas *without the benefit of gas service.* Statistics from disinterested sources support these observations. The census of 1940 accounted for 34,772,673 occupied dwellings in the United States, of which 48.6%, or 16,910,000, used gas ranges, and only 8.2%, or 2,865,000, used electricity. A great proportion of homes in the United States, almost half of them, utilized old-fashioned methods for cooking, such as coal ranges or wood-burning stoves.

• •

Anyone who is venturesome enough to predict the potential gas reserves is in the same position as those who must consider the potential oil reserves, save for this important difference—that the withdrawals on oil reserves have been on a much greater scale than the withdrawals on the gas reserves. Ralph E. Davis, widely known consulting engineer in the natural gas field, reported in October, 1942, on this subject at the Interstate Oil Compact Commission. He considered the picture of the known reserves in the five principal natural gas districts of the country:

1. The Appalachian
2. North Central
3. Mid-Continent Gulf Coast
4. Rocky Mountain
5. California

A fairly correct picture of the total proven reserves is of the order of 85 trillion cu. ft., according to Mr. Davis, and potential reserves, difficult at best to visualize quantitatively, may be of similar quantitative order. Unfortunately for our economy as now developed, the proven and potential reserves are relatively small in certain localities where the demand for gas is great and exceedingly important. Within reasonable time, these conditions could be overcome by the installation of new transmission facilities so that gas may be taken from areas of superabundance to areas strongly in demand but short of supply. Mr. Davis opines that such a development would be for the greatest good of the greatest number, for districts now approaching gas shortage would have their supply replenished at reasonable cost; and regions such as the Gulf Coastal Plain of Louisiana and Texas, endowed with enormous reserves, will find it possible to market a substantial portion of the gas output which, in part until recently and even to some extent now, is going into the air as waste.

• •

Gas fuel and its derivatives are among the nation's prime energy resources and constitute a vital component of the nation's fuel and chemical supply.

*Excerpts from an article, "We'll Always Need Gas," reprinted from the May 13 issue of Public Utilities Fortnightly, Washington, D. C.

The Effect of the War on

THE BRITISH GAS INDUSTRY

By S. J. BEALE

General Manager, West Gas Improvement Co., New York, N. Y.*

THE American gas industry has had its troubles in gearing its activities to the war, and the British have had theirs. While there is no direct parallel, a relating of some of the British successes and failures may be of value. It happened that from June, 1941, to June, 1942, my chief, Sir Frederick West, was president of the Institution of Gas Engineers. During that period he was able to assist the AGA with information needed here on various phases of the British gas industry in war, especially that concerning problems brought about by bombings. There are still many such problems to be solved in both countries, but no doubt in Britain anyway there is now a certain degree of stability in such matters. I am not going to dwell on the physical aspects to any extent, but rather on controls and adjustments which are so necessary in the continually shifting sands of a war economy.

As an example of necessary change, I would mention the official pamphlet, "Notes on Town Gas for Air Raid Wardens," which, although an official government pamphlet, was drawn up by the London Regional Gas Center in 1940 and had to be brought up to date in 1942 as a result of experience. In 1940 the government asked that industrial plants produce smoke from their chimneys as an aid to camouflage. In 1943 this request was rescinded as a measure toward the economy of badly needed fuel. No doubt reduced bombings assisted in the decision.

As you know, many acts of heroism have been performed in extinguishing fires on gasholders. About 100 King George medals for bravery have been awarded gas men for this work. Recently it has been suggested holder crowns be made of a rougher material to assist those who need to walk in such places.

Labor: Britain has shortages of critical materials as we have, as well as shortage of labor, and is continually trying to solve such problems. All engineers, including gas engineers, born between Feb. 1, 1898, and Jan. 31, 1923, had to register before March 27, 1943. All men from 18 to 50 are registered for service with the armed forces and certain civilian defense forces. All women from 18 to 40, I believe, are also registered.

Women are used in the gas industry, and at the plants they are used on both day and night shifts. Here are some of their occupations:

Carburetted water gas operators.
Horizontal retort stokers and dischargers.
Dismantling retort settings.
Oxide handling.
Bricklayers' helpers.
Coke loading.
Filling tar barrels and unloading empty ones.
Painting.
Machine shop machine operators.
Appliance fitting.
Meter repairing, testing and reading.

Certain tools have been designed especially for their use, such as smaller wheelbarrows for oxide wheeling, smaller shovels, etc. During the last war women were working in gasworks and some of those same women are back again.

Clothes are rationed, and the purchase of working clothes sometimes digs rather heavily into points allowed. For some articles the number of points is reduced or even eliminated, but only after issuance of a certificate by a factory inspector. Such items include overalls, footwear, aprons, protective garments, etc. For some, even though not clothing, the high purchase tax may be reduced if they are considered essential.

Substitution and Economies: To mention but a few items, with the normal ingredients of paints difficult to obtain, a tar base black paint has been evolved. In order to save metal, peacetime standards of bolt and nut sizes have been reduced in such matters as dimension across head and nut, a painless manner of saving metal.

Gas company showrooms now have little merchandise to display, but many are now used for blood-bank donations and as a meeting place of various local organizations and clubs—of great psychological value upon return to postwar business. This reminds me of a gas company showroom window which exhibited this notice, "During an alert we shall remain open. In the event of a direct hit we shall close at once!"

Coal: This is a matter in which we are all vitally interested just now. Since the war started Major Lloyd George, son of the British prime minister during the closing phases of the last war, was appointed as minister of fuel and power. In July, 1942, he stated there was a gap of 12,000,000 long tons between coal production and consumption. Not only the colleries but consumers, both industrial and domestic, helped to close this gap. Domestic consumers were asked to save 4,000,000 tons and now have about succeeded in a voluntary rationing scheme by using less than their normal allowances.

Coal miners were put on an output bonus scheme which apparently has not come up to expectations, in spite of the large percentage increased pay it incurred. This extra pay is not very attractive to them due to lack of consumers' goods available under the rigid British rationing scheme.

Gas companies have been receiving a much poorer quality of coal and at higher prices. You have a parallel to that. Deliveries are erratic, with the result that coal cars pile up demurrage charges. The government increased such charges by a very large amount in order to obtain continued use of badly needed cars. In many cases gas companies have not the labor required for unloading a larger than usual number of cars and are unable to help the condition. Their only recourse is to discuss the charges with the district freight officer in their area. If they have good powers of persuasion they may be able to get them reduced, just maybe!

The Ministry of Fuel and Power has issued pamphlets on various aspects of gas manufacture giving suggestions for checking the details of various plant operations, listing items in detail to insure good efficiency. Such pamphlets include carbonizing conditions, retort house operation, checking and cleaning auxiliary equipment, steam raising, etc.

Scrap: The subject of scrap is of the greatest importance, as everyone is aware. It certainly seemed so to a Brit-

*Presented before the luncheon conference at the American Gas Association Production and Chemical Conference, New York City, May 24-25, 1943.

ish government official, who happened to be a lady visiting a gasworks to survey unused plant for scrap. When informed that three tall towers were scrubbers and that only one was used in summer and two in winter, all arguments to the contrary, she noted down one for scrap. Similar notations were made for purifying boxes. Then came three gasholders, large, medium and very small. The exasperated engineer informed the lady that only the small one was used. He said the great big one was only put up to hide a new and ugly city hall built nearby. The irate lady strode away and the next day an indignant government department asked for an explanation of such treatment of their staff. The engineer explained it appeared the only way to handle one who obviously didn't know her job, and anyway public utilities were exempt from the order. The crushing retort from the high official was, "You are not a public utility—you are only a gas company!"

Competition: The gas and electric industries have declared a truce in competition against each other "for the duration," and at the request of the government. With many government officials electricity minded, it is sometimes hard for gas men to maintain the armistice when such people talk glowingly in public of the wonders of electricity, and not always without innuendos concerning gas.

War-time Efficiency: In a war economy efficiency is more important than ever. Of necessity the British have had to look around for ways of improvement. Many investigators have found out much of value, and rarely have they hesitated to publish their findings for the benefit of many. The British technical press is as full as ever of good technical matter. Most of the industry's committees are at work on problems under consideration prior to the war as well as new ones. Research is still continuing, even though scarcity of materials has in some cases reduced activity. Much work is being done with post-war activities of the industry in view.

Meeting the War Condition: Ninety-seven per cent of British gas is distributed at 400 to 500 Btu., with one plant at 200, one at 375, others up to 450, which figure is the most popular, with 500 next on the list, and many in between. There are only a few over 500 Btu., including two at 560 and two at 600. Scotland appears to have lower values than England, with a top of 475 and down to 425.

Many plants have reduced calorific values during the war in order to permit washing for benzole, an important war-time measure in Britain. This results in a 15 to 20 Btu. reduction which in normal times would have to be made up by using additional coal. Reductions in declared values have been in the region of 10 to 60 Btu. The divergence is no doubt due to certain local conditions. There have been a very few cases where calorific values have been increased, these being from 20 up to 50 Btu. They were probably due to main capacities, poorer coal quality, etc. Experience has shown that these changes have resulted in adjustments confined mostly to such appliances as water heaters. Who would dare suggest gas is not a flexible fuel? There is under discussion the suggestion of standardizing calorific values in Britain to 450, 475 and 500 Btu. No doubt this interesting subject will be pursued in more detail after the war.

Fuel Target: It appears the public must register with dealers in order to obtain supplies of solid fuels. In this case gas companies are "dealers" as to coke sales. Gas as such is not yet rationed, and there is a national voluntary rationing of this fuel. There are penalties for misuse under the "Fuel and Lighting Order." For example, hotels and theaters have been fined for unnecessary wastage. A man was fined for heating the kitchen with his oven, as was a storekeeper for substituting gas for central heating. As you have done, gas companies advertise for fuel saving. It is said the King has had lines painted around bathtubs in Buckingham Palace at the five-inch level in order to save hot water.

In many establishments "fuel wardens" have been appointed. It is their duty to see that no unnecessary burners are on or turned too high. This is especially true of restaurants, canteens, etc. A national chain of restaurants has put in this scheme with excellent results. Wardens report each week the amounts of coal, coke, gas, etc., used and savings compared with the previous week. This is reported at a weekly meeting of the staffs, and is enthusiastically received. War bonds are given as prizes.

There is an intensive fuel conservation campaign in which over 160 exhibitions have been held. The Ministry of Fuel and Power is giving an intensive course of instruction to technical officers of the army in the operation and maintenance of automatic equipment installed in army establishments.

During his early months of office, Dr. E. W. Smith, director of gas supply, visited areas of shortage and also large industrial plants using gas as fuel. He concluded that where definite shortages existed it was better to effect economies in usage rather than build new plants. He thought a national saving of 20% could be effected, and this without major changes of design or in making elaborate tests, but by using ordinary common sense.

Here are some of the things that were

Some Technical Aspects of Postwar Planning in England

EXCERPTS from remarks by Alexander Forward, managing director, American Gas Association, before Production and Chemical Conference, New York, May 24, 1943.

I thought you might be interested in the following postwar suggestions developed in interviews by *The Gas Times* of London and just come to hand, as representing the views of competent technical leaders of the industry in Great Britain. Their thoughts:

1. Reduction of the sulphur content of town gas to the lowest practicable minimum.

2. A higher standard of technical control on the works. This particularly applies to smaller undertakings.

3. A solution of the coke breeze problem. Standardization of coke grading and more attention to quality and coke utilization, in order to meet the competition from coke ovens.

4. Great care in purification.

5. Cooperation with the architectural profession to improve ventilation of houses and the provision of flues.

6. Calorific value to be fixed at value giving the greatest economy.

7. Calorific value pressures to be standardized as far as possible.

8. Traveling laboratories to allow small works to check up on technical and chemical control.

9. All buildings to be carcassed before plastering is done or floor boards laid.

10. Benzole recovery to remain; if necessary to be subsidized.

11. Improved pressure control on distribution systems.

12. There should be complete chemical control.

13. There must be a complete recovery of all by-products.

14. Manufacturers of appliances must mass-produce (pooling their resources if necessary) a standardized domestic range. It must have appearance; it must be good and it must be low in price. At the same time we must retain a line of ranges for the consumer who wants and can afford something different.

15. There must be a big improvement in internal fitting work and more extensive use of copper tubing. Poor pressure complaints must be eliminated and maintenance, particularly of water heaters, must be much improved. Burner noises must be eliminated.

16. We should adopt as standard a range of four calorific values.

happening. A furnace with a capacity of 15 to 20 M per hour was clotted with soot, and doors fitted badly. Furnaces under full heat sometimes contained only a small percentage of capacity. In another plant they expected to save 40% of gas used. In one year output was doubled, and they were using less gas. One large glass manufacturer made closer adjustments to the position and angle of burners, eliminating some. Alterations were made in gas ports to save compressed air. Consumption was reduced from 12.6 to 3.9 M per hour.

On the solid fuel side, one plant in Scotland saved 7000 long tons of coal per year, and another saved 1000 tons and increased output by 20%. Under the "Waste of Fuel Order," gas companies and others have been fined for selling fuel to unregistered customers, or amounts above prescribed quantities. One firm was fined $1500 for selling coal to employees.

On the liquid side, one gas company was fined $300 for allowing the manager and others to use benzole in their cars and for not keeping accurate benzole records. The manager was fined $500, one of his men $100 and the distillery company $550 for returning some distilled spirit to the plant without a permit. In another case a manager was fined $325, and his district superintendent $50 for "technical breaches of the regulations" when using benzole in their cars for company use.

The Ministry of Fuel and Power issues a monthly sheet, "Fuel Efficiency News," giving data on methods of fuel conservation, showing actual cases and telling how to get in touch with regional committees. Astonishing results are being obtained.

Here is the fuel target set up as an experiment for the year beginning July 1, 1942. It was expected a revision would be required after the year is completed, probably in the upward direction, especially a raising of the gas equivalent. Except for solid fuel and perhaps paraffin the scheme appears to be only a try-out for future possible rigid fuel rationing.

1 unit—½ cwt. (56 lb.) coal or coke.
500 cu. ft. gas.
50 units of electricity.
1 imperial gallon paraffin.

For each person living in a house an additional allowance of 15 units is allowed, adults and children alike.

Average consumers use three-quarters of fuel for heating rooms and water, one-fifth for cooking, the rest (one-twentieth) for lighting, gas radios and gas irons, etc.

One ton of coal or coke—40 units.
Or 20,000 cu. ft. of gas.
Or 2000 units of electricity.

Rooms	*N*	*M*	*S*
1	80	60	50
2	90	70	60
3	110	90	70
4	120	100	80
5	140	110	90
6	150	120	100
7 or more	170	140	110

Up to the present if undue hardship is experienced in the amount of solid fuel allowed, one must get in touch with the local fuel overseer for an adjustment.

The British Commercial Gas Association has a number of movies available, and even pre-war several of these have been shown in public theaters. They are available to gas companies and others. Several have been produced during the war. One of the latest is "Eating at Work" and deals with the preparation of balanced meals for war workers.

Increased Charges: Due to increased cost of coal, labor and equipment a large number of gas companies have found it necessary to increase their charges. This is done by obtaining a license from the government for such increases, and of course there are definite requirements to be met before they are granted.

Speaking of charges reminds me that Britain has a large number of pre-payment meters. In English currency 12 pennies are equivalent to one shilling. Due to some quirk of psychology, some people seem to think 12 separate pennies placed in the meter at intervals will give them more gas than the use of one silver shilling. Actually the amount of gas is the same. Some of you will know the English penny is very large and therefore contains much copper. An attempt is being made to get people with such meters, with both penny and shilling slots, to use shillings only. This will not only release much copper for the war effort, but also helps in collections, especially where collectors are women, as the copper is very heavy for them to carry.

Oil: It is essential Britain conserve all possible uses of petroleum products, as they have to be imported. Their base gas load is coal gas, peaks being made up with carburetted water gas., and some war-time reduction of calorific values are no doubt due to the need of using less oil even though not much carburetted water gas is made and the calorific value is much lower than that in the United States.

Motor transport must continue, especially as all cars for private use have been forbidden for a long time. In 1936 coke oven plants extracted benzole from 97.9% of coal carbonized, but gasworks extracted benzole from only 47.3%, apparently due to the small size of many plants. Since then many benzole extraction plants have been built. But these are not enough for the requirements, what with vast quantities of high grade fuel needed for the R. A. F., tanks corps, etc.

As in the last war, some "gas bags" have been fitted to the tops of cars and trucks. Rather short distances are possible between refilling at gasworks. Some creosote was used before the war and may be still in use. The anticipated large saving is to be with producer gas attachments, chiefly for use with buses and trucks. There is a "Mobile Producer Gas Association" and fuels contemplated are activated high temperature coke, low temperature coke, charcoal, and anthracite coal.

I have seen the following figures:

For one imperial gallon of gasoline the equivalent fuel consumption at the car transmissions is:
14 lb. producer gas.
15-17 lb. coal gasification.
30-45 lb. coal hydrogenation.
16-23 lb. steam engine.
30 lb. electric battery.

As a start there are going to be about 6000 producer gas units for vehicles. The minister of war transport has ordered owners of 10 or more vehicles to convert 10% to producer gas if they gross over 2 to 3 tons each.

In Scotland 651 buses are to be converted this year; 107 have been adapted and have run 2.5 million miles and saved 415,000 imperial gallons of liquid fuel.

London is to have 550 buses converted, with a saving of 3.5 million imperial gallons per year. Each bus burns one long ton of anthracite per week and will be refueled each 80 miles. Twenty-seven service stations are arranged.

Government Controls: The British Gas Federation is composed of a voluntary membership which includes most of the country's gas organizations. The minister of fuel and power recently told the chairman of the federation that it is vitally important for the gas industry to formulate its plans for the future *now*, and that a plan should be submitted *within six months*, otherwise the government itself will undertake such a plan. The British Gas Federation has appointed a "fact finding committee" which no doubt will study such matters as grouping, amalgamation, holding companies, location and ownership of plants, quantitative surveys, density of demand, position of coke ovens, capacity of existing plants, standards of service to consumers, by-product disposal, prices charged in various parts of the country, etc.

THE EMERGENCY REPAIR ORGANIZATION

Of Coast Counties Gas and Electric Company

By K. B. ANDERSON

Coast Counties Gas & Electric Company, Santa Cruz, Calif.

WHILE the gas department has for many years maintained an emergency organization plan to cope with emergencies such as floods, earthquakes and various failures of plant, these plans have undergone considerable revision to dovetail into the OCD set-up.

The plans have been drawn up in district units, although it has been repeatedly pointed out to agencies seeking jurisdiction over our program that our entire system must be considered as a unit in any major catastrophe. Districts are interdependent upon one another through physical interconnection of transmission lines as well as through personnel organization. During the present shortage of manpower few districts are sufficiently manned to cope with a major disaster.

In order to describe our general organization plan, the Santa Cruz district will be described in some detail as representative of all districts. The Santa Cruz OCD organization is closely patterned after the standard Citizens Defense Corps plan.

The city is divided into four districts as to warden organization but all emergency functions of the general services are through one central control center located in the basement of the city hall, where suitable protection from bomb splinters, satisfactory blackout facilities, and facilities for heating, ventilating and communication are available. This headquarters is divided into two rooms, one a message room for receiving incoming calls and preparing reports, the other a control room for the staff and service chiefs.

Control Room

The control room consists essentially of a plotting board, a series of "service" stations and a "controller."

The plotting board is shown in Fig. 1. It shows the location and type of the incident, the services needed and the disposition of facilities available.

The "service" stations are arranged along one side of a long table and are manned by the chiefs of the various services such as:

Police	Decontamination
Fire	Medical
Bomb squad	Utilities
Water department	(a) Gas
Street department	(b) Electric
	(c) Telephone

Each chief has a map, a pad of message forms (each station a distinctive color), a telephone and an operator, located across the table from the chief.

In the event of an "incident," wardens call direct to the "message room" by using one of two unlisted telephone numbers. The message, written out in triplicate on a special form, passes to a communication officer, who checks quickly for essential details, assigns an incident number, keeps one copy for future reference to avoid duplication of incident numbers, and two copies of the message pass to control room.

One copy of the message from the message room goes to the "plotting officer," who posts the information on the map, showing by colored pins the type of incident, streets blocked and incident number. His copy then goes to the "panel" clerk, who places markers for services needed, etc., and passes the copy to the records clerk.

The second copy of the message goes to the "controller" (seated at the head of the long table), who reads the message aloud.

The chiefs of the various services, from the text of the message and from the disclosures on the "panel," decide what equipment in their particular department is required. In the case of the utilities station, we have our own set of "push pins," marked by number and color for each unit of gas, electric or telephone equipment. If it is decided to dispatch a certain crew, that pin is removed from its normal location and moved to the site of the incident on our map. A message is then written out on the message form giving the essential information, such as:

1. Incident number and time.
2. Location of incident.
3. Crew to be dispatched.
4. Type of bomb or damage.
5. Streets blocked.

This message is handed across the table to our operator who has kept a line open to our operating headquarters. After transmitting the message over the phone, the operator hands the message to the panel clerk, who moves a pin on the panel board indicating that that particular service has been dispatched. Upon return of a crew to its normal location after performing its mission, the dispatcher at operating headquarters gives the information to the operator, who writes out another message giving: incident number and "crew returned," shows it to the chief, and hands it to the panel clerk, who then removes the marker from the incident space and returns it to the "pool." The chief at the same time returns his push pin to normal location.

With all other services functioning in a like manner, a comprehensive picture of the situation is always before the staff and those responsible for the various services.

Organization Set-up

From this centralized beginning the organization and functioning of our own forces is as follows:

Chiefs of gas, electric and telephone are at the control center, functioning through a common operator.

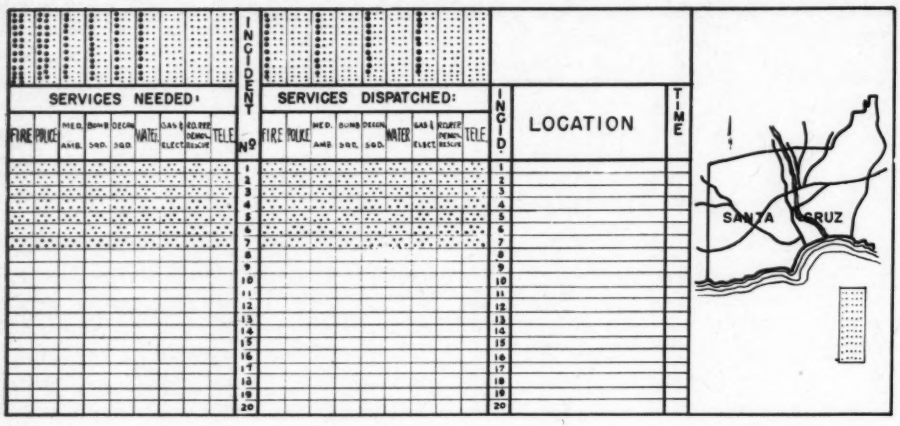
The gas operating headquarters is at our normal location, namely, the district gas foreman's office at the warehouse. The foreman acts as the "gas crew dispatcher." Messages from the operator at the control center are received by a "message center" at the warehouse. The message center consists of two men familiar with the city and our operations; one receives and records the message, the other records road blocks, transmits the message to the appropriate "dispatcher" (both gas and electric foreman are at the same location) and keeps a record of the crew's location.

The dispatcher, upon receiving an order, checks the location on the regular distribution maps to visualize the effect of the incident upon the system and to coordinate the present incident with those that have gone before. He then calls the particular crew which has been assigned by the control center and gives them the basic information plus any special instructions which the situation requires.

The crews themselves are decentralized so that operations cannot be completely immobilized by the destruction of an important bridge or artery.

The crews each consist of at least two men and are equipped with gas masks and arm bands (furnished by the OCD), and usually a ½-ton pickup on which has been loaded, at the

CONTROL CENTER PANEL BOARD.



first warning of a raid, a box containing the following equipment:

2 picks.
2 shovels.
2 pipe wrenches—10-in. or 14-in.
2 pipe cutters—¾-in. to 4-in.
1 hacksaw and 6 blades.
6 service stoppers (1 each ¾-in., 1¼-in., 2-in., 3-in., 4-in., 6-in. where required).
1 valve wrench or wrenches to fit valves in district.
1 bar.
1 water can with pump hose and nozzle.
3 sections 4-in. or 6-in. vent pipe.
6 burlap sacks (3 dry sand, 3 empty).
2 pairs heavy gloves.
1 flashlight (blackout).
1 valve map of district.

Besides the street or OCD crews, there are detailed a gas plant crew and a map section. These are called from the central control station by the chief if and when their functions are required.

In order to avoid duplication of equipment, loss of time in reaching mission, and return to headquarters, orders have been issued that crews obey only instructions from their dispatcher, and dispatchers (and the two special sections) obey only instructions from the service chief at control headquarters.

General instructions to crews are that no repairs to mains or services are to be attempted except under specific orders from dispatcher. Normal treatment (except in case of station or transmission damage) will be isolation of the affected area by valving off mains serving it. Captains of street crews are required to familiarize themselves with the mains and valves in their respective areas so that they will be able to determine quickly what valves to close and how to find them under conditions of darkness and confusion.

In order to assure a workable organization at all times, an organization sheet is kept up to date and distributed to all affected employees, showing their assignments, alternates and how they will be notified.

A nucleus consisting of the gas superintendent, district foreman, message center and a district commercial office force are called by phone upon receipt of "yellow" signal from police station. The commercial office force upon the "blue" signal calls certain designated key employees. All employees report to their stations upon the "red" or air raid siren signal. During the emergency, commercial employees are utilized as messengers in the event of failure of communications.

All employees are requested to notify their immediate supervisor if they plan to be out of the district during off-duty periods, in order that substitutes can be assigned.

Notes on Experience With OCD Drills

Periodic drills for training purposes are conducted weekly in Santa Cruz. About once a month "equipment actually rolls." The other drills are with personnel at headquarters and field work simulated.

Each drill brings to light weaknesses in the plan which are remedied as soon as possible. These weaknesses fall into two groups:

1. Those faults which cause the drill to make a poor "paper showing."

2. Those faults which might impair the efficiency during an actual emergency.

Under the first classification come such items as:

a. Failure of wardens to definitely locate the incident in his reports. (The location of an actual bomb crater of course would be obvious.)

b. Failure of crew to report arrival or completion of assignment to warden. (This too, would be obvious.) To take care of the "paper showing" we have instructed our crews to report to the warden upon arriving at the site and to give him a written message upon completion of the mission showing what action the crew had taken.

c. Failure of service chief to report return of crew to headquarters. (This, of course, would be comparatively unimportant in an actual situation as long as the chief knows crew's whereabouts.)

d. Crews going into or through gas or roped-off areas, blocked streets, bomb craters, etc., or into gas areas without proper equipment.

Under the second classification come such items as:

a. Crews taking orders from district wardens, bystanders, etc., resulting in lost time and frustration of mission.

b. Failure along the line to inform crews of road blocks, craters, etc., resulting in lost time and possible immobility.

c. Lack of knowledge of network and valve identification, resulting in failure to shut off area or in shutting off or impairing otherwise unaffected areas.

d. Failure on part of warden or control center to recognize need of gas crew services where damage is not immediately apparent.

In general, the drills have provided an ideal medium for training of both the Civilian Defense group and our employees. On "non-equipment" drills we have one man from each district report at warehouse and indicate from distribution maps what action he would take. The men on duty are rotated to distribute the training and lessen the inconvenience of weekly duty.

The company's position has been that such after-hour duty is part of the Civilian Defense plan and no payment is made for time or traveling. We have requested the authorities not to appoint our operating personnel on other civilian duties such as district wardens, spotters, etc., which might interfere with their availability to us in an emergency.

We feel that by giving the local authorities full cooperation in their planning and drilling, we have made more certain of retaining control of our own facilities during emergencies.

As a result of intensive study of "sectionalizing" our systems we have installed many new valves, installed many "frames and covers" on existing valves, and located, rearranged or serviced many others.

We have prepared in letter size form small scale maps of each of our towns upon which can be shown principal valve locations and other pertinent information.

We have photographed, on 35 mm. microfilm, all of our distribution maps which are posted in the field, in order to have some record to work from in the event the maps should be destroyed. These films are retaken each year or as important changes require, and are kept in a safety deposit vault in locations far removed from the coast or likely bombing targets.

WATER GAS AND COKE OVEN OPERATIONS

(A Symposium)

1. Silicon Carbide Solid Linings

A. S. HALL, superintendent, Springfield Gas Light Co., Springfield, Mass. Excerpts from a paper, "Silicon Carbide Solid Linings for Water Gas Generators."

FROM the highly satisfactory application of silicon carbide refractories to the linings of boiler furnaces, it was reasoned some 25 years ago that those refractories should be equally valuable in the linings of water gas generators. As is often the case, however, material so advantageous in one field was not applicable in exactly the same way in the other. It has taken much study and experimentation to work out the best methods of utilizing the special properties of silicon carbide in generators, but success has been achieved.

Two of the earliest installations were made in a 9-ft. set at New Bedford, Mass., and a 10-ft. 6-in. set at Springfield, Mass., in 1918. The blocks consisted of thin silicon carbide faces dovetailed into a heavier clay backing. Although the test lasted only a few months, it proved that clinker trouble could be practically eliminated. No longer life was obtained than with clay because the silicon carbide veneer began to break off and the destruction spread rapidly. This type was abandoned.

Another installation in the New Bedford plant consisted of a 4½-in. thickness of silicon carbide circle bricks of a type known as "Refrax." This product was silicon carbide recrystallized in an electric furnace without any bonding material. While the refractoriness was extremely high since silicon carbide does not melt, but is decomposed at around 4000° F., these bricks were inherently porous and allowed gas penetration. They were placed in an 11-ft. U. G. I. machine backed up with 9½ in. of firebrick and 2½ in. of diatomaceous earth brick.

The set, started in March, 1921, operated eight months until the vertical seams of the steel shell opened up due to the growth of the lining. After temporary repairs, operation was continued until March 28, 1922, at which time a shutdown for relining was necessary after 4123 gas-making hours. Clinker troubles had been practically nil; the work required to remove the clinker had been trifling compared to that of cleaning off clay blocks. The swelling and the disintegration of the lining were the causes of failure.

This swelling was the result of slow oxidation of the silicon carbide to silica which has a larger specific volume than that of SiC. This reaction was speeded up by penetration of the very porous "Refrax" by oxidizing gases. Consequently, it was reasoned that bonded silicon carbide bricks, which could be made much more dense and impermeable and still be sufficiently refractory, should meet the requirements. So a bonded silicon carbide lining was installed which stood up for 6687 gas-making hours. A subsequent similar lining lasted for 8442 hours, followed by one giving 12,158 hours, and another 8629 hours. These figures compared to approximately 1000 hours life for fireclay linings in the same units.

At Springfield, Mass., one of these earlier bonded silicon carbide brick linings lasted 7000 hours. In another similarly lined set, clinker removal costs were reduced as much as 40% and the labor cost for lining lowered due to the decreased number of shutdowns.

It was found advisable to make definite provision for lining expansion and several methods have been worked out which are eminently satisfactory. Shell splits from lining expansion no longer occur.

While silicon carbide linings showed savings over fireclay in these early installations, life did not equal that in boiler furnaces. Much research has been devoted to bettering the silicon carbide lining compositions to meet the conditions and the modern products are greatly improved over the earlier ones. When the average life of a clay lining is around 1500 hours, a silicon carbide lining will usually last 8000 to 10,000 hours. Under very favorable conditions, as much as 17,000 hours of life has been reported.

In some early installations with silicon carbide linings it was found that overheating of the door frames and doors occurred due to the high thermal conductivity of this refractory. By insertion of proper insulation this has been overcome. Likewise, cast iron lintels which formerly became easily overheated and warped have been replaced by special shapes of bonded silicon which make up the door arches and skews, carried in turn, on jamb brick of the same composition forming the door openings. The great strength of these brick at high temperatures is of special importance in these locations.

Today, with the increasing demands for larger gas production and the practical impossibility of obtaining additional equipment, attention must be given to raising the capacity of existing apparatus. In the case of the generators the most obvious methods of attack are to lower the percentage of idle time and to increase the effective area of the grates. The latter may be brought about by checking the adherence and building out of clinker on the walls, or by enlarging the inside diameter of the generator through reduction of lining thickness, or by both. The former will be effected by decreasing the time required for barring clinker off the walls and that for relining.

Extended experience has shown that silicon carbide linings largely eliminate clinker adherence, thus keeping the grate area relatively unobstructed; permit easy and rapid removal of the small amount of clinker that may develop, so that the units may be operated from 22 to 23 hours daily with increases reported as much as 15% to 20% in make; and under some conditions as described by R. J. Horn in *American Gas Association Monthly* for June, 1942, 2½-in. thick tongue and groove silicon carbide linings may be

ON THESE PAGES are presented excerpts from papers presented before the Joint Production and Chemical Conference of the Technical Section of the American Gas Association, held at the Hotel Pennsylvania, New York City, May 24 and 25, 1943.

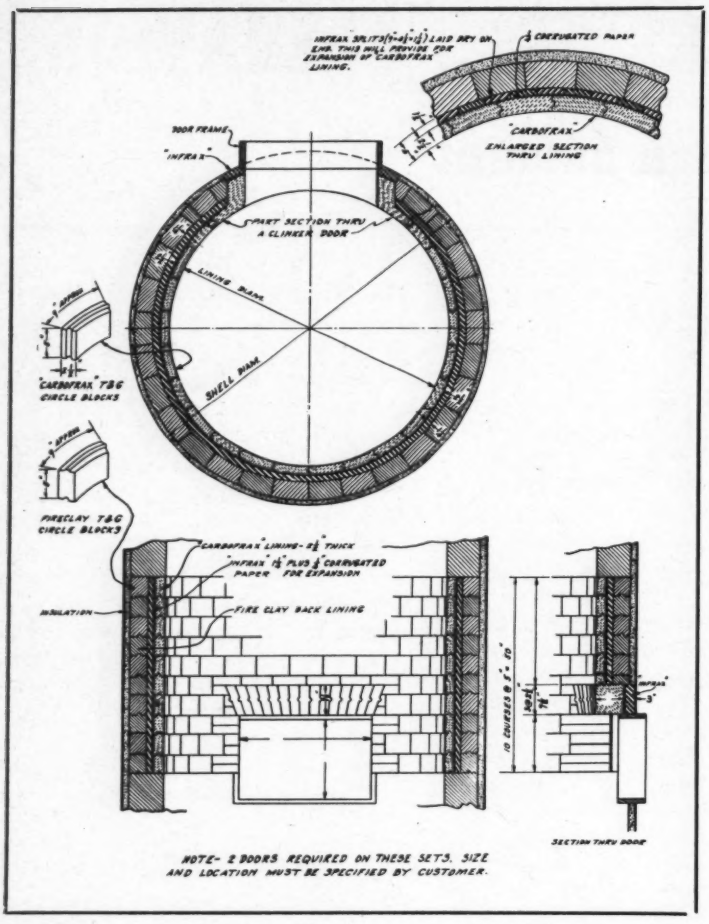

INFRAX BRICKS (9-4½-2½) LAID DRY ON END. THIS WILL PROVIDE FOR EXPANSION OF CARBOFRAX LINING.
½ CORRUGATED PAPER
"CARBOFRAX"
ENLARGED SECTION THRU LINING
DOOR FRAME
"INFRAX"
PART SECTION THRU A CLINKER DOOR
LINING PLATE
SHELL PLATE
"CARBOFRAX" T&G CIRCLE BLOCKS
FIRECLAY T&G CIRCLE BLOCKS
"CARBOFRAX" LINING-2½" THICK
"INFRAX" ½" PLUS ½" CORRUGATED PAPER FOR EXPANSION
INSULATION
FIRE CLAY BACK LINING
10 COURSES @ 2½" = 25"
SECTION THRU DOOR
NOTE- 2 DOORS REQUIRED ON THESE SETS. SIZE AND LOCATION MUST BE SPECIFIED BY CUSTOMER.

FIG. 1

A typical lining arrangement of water gas generators with two doors 2½-in. Carbofrax brick inner lining.

used in place of ordinary 4½-in. silicon carbide circle brick with proportionate enlargement of grate area and gas capacity. As for shutdowns for relining, silicon carbide outlasts firebrick around 6 to 1.

A further important consideration regarding linings is their inertness to the inferior fuels that often have to be used under present conditions. Here again silicon carbide shows up to excellent advantage, for, although it naturally will give better results with proper coal or coke, it will maintain its advantage over fireclay in the proportions discussed above. Silicon carbide linings not only eliminate most of the clinker problem but they resist very well the abrasion of the increased amounts of ash from low grade fuels. Furthermore, they will stand up far better than fireclay against a heavier blast, since they resist much higher temperatures. Being far less porous, they will not become "loaded" with carbon the way a firebrick will.

2. Underfiring with Refinery Oil Gas

E. E. WITHAM and J. H. LONG, gas department, Philadelphia Electric Co., Philadelphia, Pa. Excerpts from a paper, "Underfiring a Coke Oven Battery with Refinery Oil Gas."

THERE are two economic reasons for using refinery gas instead of coke oven gas or producer gas for bench fuel.

1. To increase gas production capacity with a minimum of additional investment.

2. To effect a saving in the overall cost of producing gas.

These two objectives have been attained and it is proposed to continue the present method of operation until some major alteration in the economic situation occurs.

The coke oven battery consists of 25 ovens having a coal capacity of 13.23 tons each. The Koppers underjet design having waste heat recirculation was selected because it appeared to have certain advantages as to flexibility of coking time, and for the use of refinery oil gas for underfiring. This battery was placed in operation in May, 1942.

It is interesting to note that the interchangeability calculations of M. Frank Knoy (*GAS*, June, 1941, and July, 1942), when applied to the determination of Btu. of the refinery gas-air mixture for underfiring the ovens, check actual experience quite closely.

Fig. 1 is a diagram showing the equipment used to obtain the desired refinery gas-air mixture.

The refinery gas used for underfiring the battery is supplied from a nearby oil refinery through a 6-in. welded steel main and first passes through a high pressure positive displacement meter (A) at a pressure varying from 20 to 50 psi.

After the gas leaves the meter it passes through a pounds to pounds regulator (B) where the pressure is reduced to 1.5 lb. psi. gauge pressure, and then through a pounds to inches regulator (C), which further reduces the pressure to approximately 5.0 in. of water. The gas then flows into a small holder (D) called a gasometer tank. This consists of an inverted cylindrical float in an oil-filled tank. The gas enters and leaves through two vertical pipes. Sufficient pressure from the regulator (C) must be maintained to keep the float at a constant level.

Dual Meter Installation

It will be noted that a high pressure refinery gas meter as well as a low pressure coke oven gas meter are installed. Both are of the positive displacement type. The latter had been used with the old battery, but when underfiring with refinery gas it was found to have so much inertia, due to its size, as to be slow in starting after the pause during reversal. This sluggish operation resulted in "starving" the gasometer tank of the Kemp machine of gas, and the automatic control would shut the machine down. The high pressure meter is smaller and a higher differential pressure can be carried while it is starting up. It, therefore, accelerates more rapidly.

A further cushioning effect was obtained by connecting the Cottrell precipitator to serve as a reservoir of gas between the high and low pressure regulators. The use of the Cottrell as a precipitator is desirable when using coke oven gas, but is not necessary with refinery oil gas.

From the gasometer tank (D) the gas passes through a check valve (G) to the Kemp gas and air proportioning machine. This machine includes air filter (E), inlet check valves (G and F), proportioning valves (H), positive displacement blower (I), by-pass governor (J), and an outlet check valve (K). Its purpose is to mix the refinery gas with air in previously determined proportions. The air is drawn in through the fine mesh filter (R)

past the floating check valve (F) to the proportioning valve (H). Gas from the gasometer tank (D) passes another floating check valve (G), and also enters the proportioning valve (H). The purpose of the check valve (F) is to prevent the escape of gas to the atmosphere in case the Kemp machine stops. The proportioning valves (H) admit the refinery gas and the incoming air in the proper proportions.

Limit Switch

The gasometer tank is equipped with a limit switch that shuts down the Kemp machine and blows a siren if the gas supply in the tank decreases below a predetermined point. This eliminates the possibility of pumping air into the fuel gas header and warns the operators that the refinery gas supply has failed.

Positive displacement blower (I) draws the gas and air from the proportioning valves (H) and places the gas-air mixture under pressure. The blower is driven through a Texrope drive by a 20-hp. induction motor and is equipped with a by-pass governor (J) which maintains the discharge pressure constant. The check valve (K) in the discharge line prevents reverse flow of the gas.

After the refiner gas-air mixture leaves the blower (I) it passes through the heater (L), where the temperature of the mixture is increased to 120° F. The gas-air mixture then passes through the Askania regulator (M) and enters the bench fuel header (T). Regulator (M) maintains the desired pressure on the bench fuel header. From the bench fuel header the mixture passes through the shut-off cocks (N), through the reversing cocks (O) and into the fuel gas header (P). The fuel gas header supplies the mixture to the jet nozzles.

An emergency regulator (Q) is installed to feed gas from the coke oven gas main to the bench fuel header in the event that the pressure drops to 6 in. of water pressure, due to a shutdown of the blower or other reasons. Thus a positive pressure on the header is always maintained. An automatic alarm warns the operators if the blower stops, and the emergency regulator supplies enough fuel to prevent rapid cooling of the ovens until the refinery gas supply is restored. In case of a prolonged interruption of refinery gas supply, the ovens can be quickly converted to complete oven gas underfiring as explained hereafter.

Relief Valve Installed

A relief valve (R) is installed in the line between the pounds to pounds regulator (B) and the pounds to inches regulator (C). The discharge from the relief valve passes through a meter and into the collecting main. The purpose of this valve is to discharge refinery gas into the collecting main in the event that the pounds to pounds regulator does not close tightly on the reverse of cycle, and the pressure increases to 5.0 psi.

The foregoing description, referring to Fig. 1, explains the mixing of the refinery gas-air mixture and the delivery of this mixture to the jet nozzles. In Fig. 2 is shown the injection system of recirculating waste gases employed in the Koppers-Becker oven. A portion of the products of combustion is drawn from the waste gas stream at the base of the down-flowing flue and aspirated through the underjet and cross-connecting ducts. In this system the refinery gas-air mixture and recirculated waste gas are thoroughly mixed by the action of the jet. This diluted mixture passes through the underjet gas risers and enters the up-burning combustion flues. Regenerator air also enters the base of the up-burning combustion flues.

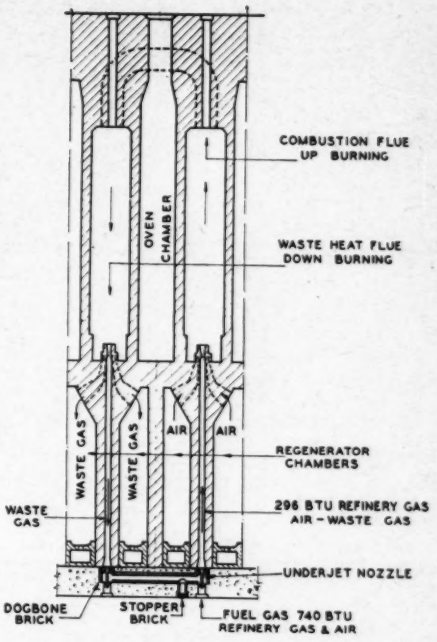


FIG. 2. Oven cross section showing waste gas recirculating ducts.

The coke oven battery of 25 ovens has a total of 26 heating walls with 16 underjet nozzles supplying bench fuel to each wall, giving a total of 416 nozzles. When the preliminary tests were conducted on the use of refinery gas for underfiring, the thought of using the coke oven gas underjet nozzles when underfiring with refinery gas was always kept in mind. This would eliminate the necessity of changing all the nozzles when changing over to oven gas and when changing back to refinery gas underfiring.

As a result of the preliminary tests conducted on two and later on four heating walls, a proper balance was reached that enabled the use of refinery gas for underfiring with even wall temperatures using the coke oven gas underjet nozzles without the formation of carbon in the gas risers.

Refinery gas as received varies in heating value from 1500 to 2000 Btu. per cu. ft. This gas is mixed with sufficient air in the Kemp gas and air proportioner to maintain the heating value of the refinery gas-air mixture going to the battery at 740 Btu. Changes in the heating value of the refinery gas are compensated by manual changes to the Kemp proportioning valves.

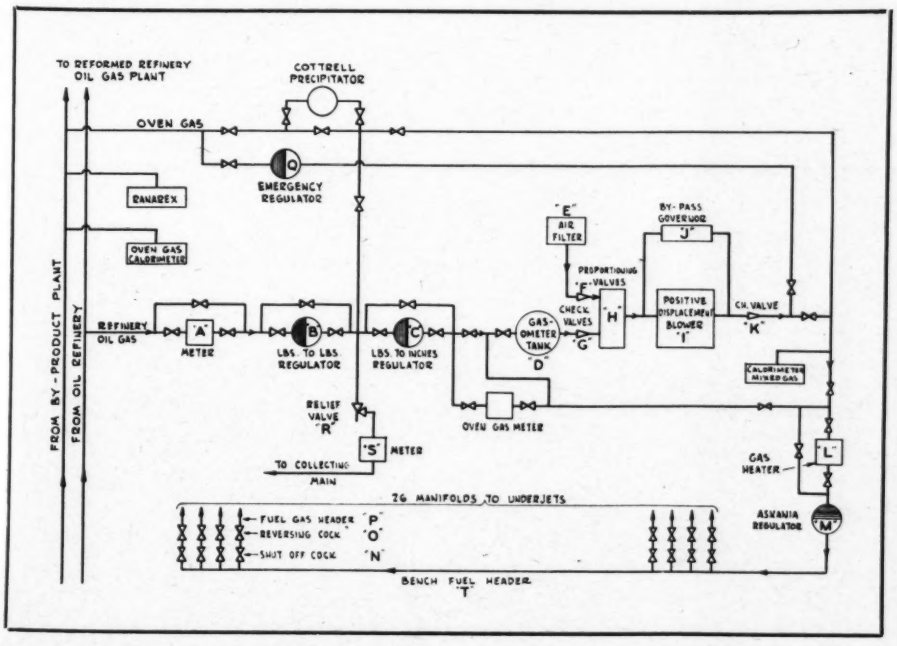


FIG. 1. System for underfiring under-jet battery with refinery gas-air mixture.

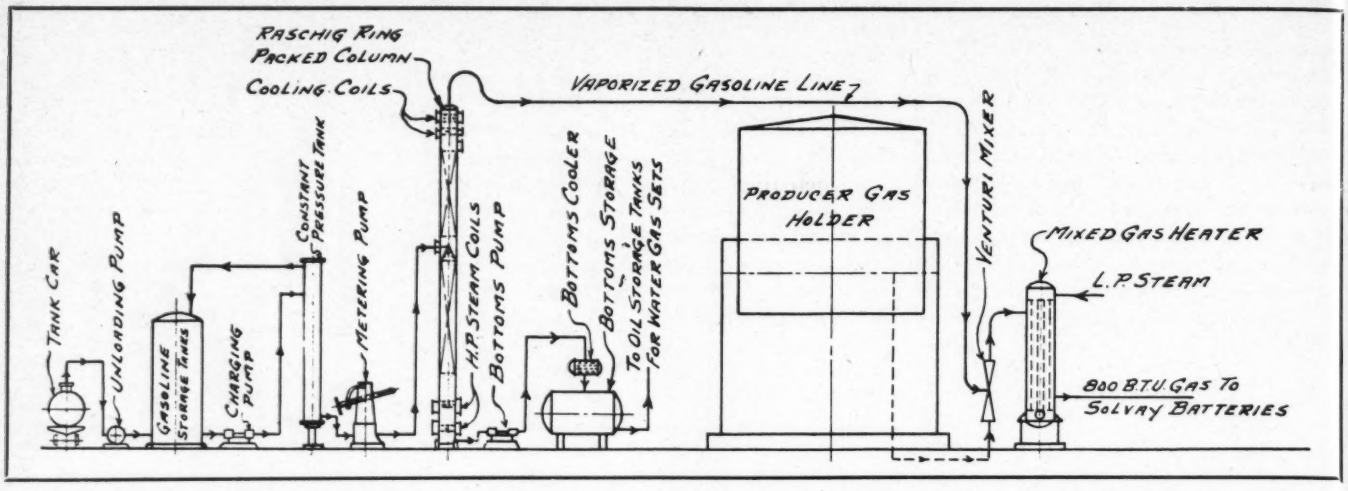


FIG. 1. Flow diagram of natural gasoline enrichment of producer gas for use in underfiring Solvay coke ovens.

3. Gasoline Enrichment of Producer Gas

W. O. KEELING, research department, Koppers Co., Pittsburgh, Pa. Excerpts from a paper, "Natural Gasoline Enrichment of Producer Gas for Use in Underfiring Recuperative Type Solvay Ovens."

THE Milwaukee Solvay Coke Co. operates two batteries of Koppers Becker ovens and two batteries of Solvay recuperative type ovens. The Koppers ovens are underfired with producer gas, releasing all the coke oven gas made for sale to the affiliated Milwaukee Gas Light Co., which distributes the gas in the city of Milwaukee. In the past, the Solvay ovens have been underfired with coke oven gas, leaving only the surplus gas they produced for sale to the affiliated company.

Approximately 4000 Mcf. of coke oven gas per day are used in underfiring the Solvay ovens. If this gas could be released by use of another gaseous fuel, the coke oven gas output of the plant could be increased by approximately 12%. But experience has shown that the Solvay ovens could not be underfired successfully with a gas having a heating value of less than 385 Btu. per cu. ft. Hence, producer gas or even blue gas could not be used. Nor was the use of carburetted water gas indicated because the coke oven gas was desired for peak load purposes; and if a carburetted water gas machine had to be installed, it might as well have been installed and used to directly produce a corresponding volume of peak load water gas.

Faced with these conditions, J. A. B. Lovett, president of the Milwaukee Solvay Co., requested the Koppers Co. to devise a method for releasing the coke oven gas for peak load purposes. The method could not require critical materials or equipment, and the equipment was to be such that it would be reasonable in cost and could be largely fabricated in the company's shops and erected by the company's engineers and personnel. Furthermore, the necessary equipment had to be installed and ready to operate by December, 1942.

It was found upon investigation that there was a plentiful supply of so-called natural gasoline available in the Mid-Continent oil producing areas and that the supply of this material would be but little affected by any foreseeable demands of the synthetic rubber program. The material was cheap in price and could be transported in readily available types of tank cars because of its low vapor pressure. This latter factor also made possible its storage in ordinary steel tankage of reasonable strength. A number of different grades of natural gasoline are available. The grading usually is based on Reid vapor pressure at 100° F. Two samples of natural gasoline investigated had the properties shown in Table 1.

It is apparent that a large percentage of at least two natural gasolines is of sufficient volatility to be useful in carburetting fuel gas. For this reason, natural gasoline was selected as the carburant for enriching the substitute underfiring fuel.

With the selection of the carburant, there remained only the problem of its vaporization and admixture with the base gas and the selection of the base gas. Producer gas rather than air was chosen because its use eliminated any possibility of backfiring from the oven flues through the gas mains in case equipment failure caused an explosive mixture to accumulate in the gas mains as could happen when using air.

Investigation also disclosed that the carburetted gas must have a low dew-point because part of the gas mains and branch headers were exposed to wind and temperature well below zero degrees Fahrenheit. This meant that when carburetting producer gas to 800 Btu. per cu. ft., the heating value selected, the gas must contain no hydrocarbons which would condense out at a minimum temperature of at least —10° F. But all samples of natural gasoline investigated contained appreciable quantities of hydrocarbons boil-

TABLE 1

	Sample from Phillips Petroleum Co. % by Volume	*Sample from Carter Oil Co. % by Volume*
Butane	36.17	30.65
Iso-pentane	10.02	17.95
Pentane	12.42	22.05
Iso-hexane	3.81	.....
Hexane	11.33	29.35
Iso-heptane	8.25	Hexane
Octane and heavier	8.87	and
		Heavier
	Other Properties	
Reid vapor pressure at 100° F.	26 PSI (abs.)	24.5 PSI (abs.)
Initial boiling point	(Not given)	62.6° F.
% off at 140° F.	70.0	81.5
90% off	275° F.	.....
End point	375° F.	288° F.

ing as high as 400° F. and the cheaper grades would vary considerably in composition from shipment to shipment. To meet this situation, it was decided to combine fractionation with vaporization and to separate out of the gasoline actually used for enrichment the hydrocarbons having boiling points exceeding a selected temperature. The hydrocarbon residue remaining was then to be used as the carburant in making carburetted water gas.

With the foregoing data at hand, the design of suitable carburetting equipment was worked out, shown schematically in the flow diagram (Fig. 1).

The method of operation was quite simple. Natural gasoline was unloaded from tank cars into the plant storage tanks. From there it was picked up by a reciprocating pump and forced into a constant pressure tank to insure that it could be drawn into the metering pump under sufficient pressure to prevent vapor-binding of the metering pump with a consequent fluctuation in the volume of gasoline delivered by the latter.

The unit had sufficient operating flexibility that most any type of gasoline from propane to motor gasoline could be used for carburetting the fuel gas. The particular operating conditions, selected for the type of natural gasolines used, were such that the gasoline was "cut" between the hexane and heptane fractions. The bottoms had an initial boiling point of approximately 185° F., an end point of approximately 430° F., and an API gravity of approximately 58° F. It made an excellent enriching oil for carburetting water gas.

The unit was put in operation the 15th of December and continued in operation until April 1 of this year, when the need for peak load gas no longer existed. The results obtained were highly satisfactory and exceeded the design calculations.

4. Two Shell Water Gas Sets in Boston

D. S. REYNOLDS, vice president and chief engineer, Boston Consolidated Gas Co., Boston, Mass. Excerpts from a paper, "The Two-Shell Water Gas Sets in Boston."

A TWO-SHELL machine consists of a standard generator and a gasifier, which combines the functions of the carburetter and superheater in a single shell. The carburetter is the lower portion of this shell, and the superheater is the upper. The machines are constructed with back-run and for gas oil operation, but provision is made for future heavy oil equipment.

The gasifier is 11 ft. in diameter by 50 ft. high, its lower end is supported by a foundation at ground level and the upper end is fitted with the gas take-off tee and stack-valve.

The generator is 12 ft. in diameter and is fitted with an A. B. C. mechanical grate. It is placed at such a height that clinker can be dumped into a truck on the ground floor below.

For a distance of 8 ft. above the grate the generators are lined with carborundum brick. Individual turboblowers, rated at 36,000 cfm. at 84 in. of water column, are installed in a gallery at the level of the clinker floor. The exhaust from the turbines is connected into an accumulator and the exhaust steam is used in the sets. An oil-operated regulator is provided. In the upper part of the gallery at the operating floor level, model "U," 10 port controls are placed, in pairs, facing each other, and the rooms in which they are located are partitioned off from the main building by steel and glass partitions. Each control is equipped with selectors, and automatic shut-down mechanism is provided. Gauge boards are installed over each control, each fitted with two pyrometers, steam meter, air meter, electric clock, grate timing mechanism, low pressure steam gauge, hydraulic pressure gauge and two oil gauges.

From the top of the generator a firebrick lined pipe extends to a dust pocket. From the side of this pipe a connection of the same size and construction is made to the down-comer which connects to the bottom of the gasifier.

The checker brick in the lower part of the gasifier is supported in the usual way. Above the level of the checkers, a relieving arch is sprung to carry the checker bricks in the upper or superheater section.

The secondary air blast is introduced at the bottom of the gasifier and the tertiary blast is supplied by two inlets, diametrically opposite to each other, and located in the space between the relieving arch and the top of the lower checkers.

Two oil sprays, 180° apart, are also introduced into this space, somewhat lower down than the air inlets.

A double inlet wash box with a conical bottom is placed on the level of the operating floor. The gas take-off from the top of the gasifier connects to one inlet and the backrun pipe runs from the other to the bottom of the generator.

The uprun and backrun dip pipes are provided with a submerged type valve, so constructed that when the backrun valve is closed the uprun valve is open, or vice versa. The hydraulic cylinder also operates a safety block to prevent the hydraulic water from reaching the generator blast valve cylinder when the backrun valve is open. The generator blast valve also operates a safety block to prevent the wash box valves from reversing when the generator blast valve is open.

Steam is admitted to the gas take-off pipe at the top of the gasifier for the backrun and to the backrun pipe for the uprun. A hydraulically operated butterfly valve changes the flow from one to the other.

In the pipe leading from the wash-

TABLE 1. OPERATING RESULTS

Month 1942	Make* Per Set MM cu. ft.	Coke/M Lb.	Oil/M Gals.	Tar/M Gals.	Carburetted Water Gas Analysis CO_2	Ills.	Os	CO	CH_4	H_2	N_2	Btu.†	Sp. Gr.	H_2S Grs. 100
November	6612	33.2	3.51	1.1	2.5	7.9	0.5	30.9	8.2	39.1	10.9	511	.67	48
December	7089	27.2	3.47	1.02	3.0	8.2	0.4	31.8	7.6	38.8	10.2	491	.68	50
1943														
January	6836	27.1	3.22	1.00	2.6	8.4	0.4	29.0	6.6	43.0	10.0	487	.66	51
February	6866	28.5	2.52	.91	3.6	7.6	0.4	33.1	5.7	38.7	10.9	463	.66	48
March	6932	29.6	2.53	.87	3.4	7.5	0.4	33.7	5.8	38.1	11.1	460	.66	51
Typical backrun analysis					2.5	1.0	0.2	22.5	5.0	66.1	2.7			

*Includes charging time—dumping ash.

†Due to the fact that the major portion of the gas distributed is coke oven gas, when producer gas dilution is eliminated, the water gas Btu. is varied to keep the value of the mixed gases at 528 Btu. per cu. ft.

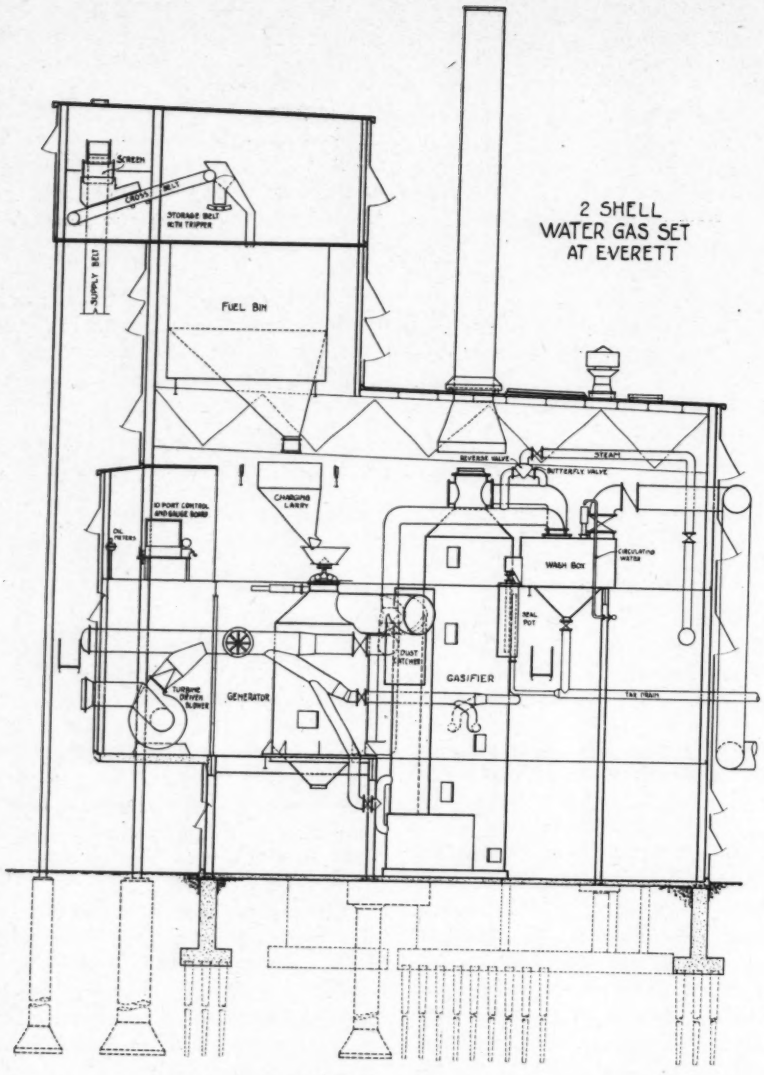


FIG. 1. Assembly of two-shell water gas set.

box to the collecting main is located a check valve which closes when the stack valve opens, or vice versa.

Over each generator is a 75-ton fuel bin which is filled by a belt conveyor system supplied by the existing double skip hoist which takes coke from a track hopper. A shaker type screen is included in the coke handling system.

There are two electrically driven traveling weigh larries, of four-ton capacity, for receiving coke from the bins and charging it into the generators.

The building is of steel frame closed in with corrugated transite and with steel sash glazed with wire glass. The roof is of concrete with a smooth finish; no roofing material is used.

The assembly is shown in Fig. 1. Operating results are given in Table No. 1.

California Butadiene Plant in Operation

THE new butadiene plant of the Southern California Gas Co., Los Angeles, was placed in partial operation during the week of June 14 when the first two units of the 10-unit plant began the production of butadiene, which will be combined with styrene to form Buna-S rubber at the combined rubber plant recently completed in the Los Angeles area. It is expected that the remaining eight generating units will be placed in production in the near future and that the plant will be operating to capacity by the end of August, according to an announcement by H. L. Masser, executive vice president of the company, who is in charge of the construction and operation of the plant.

The Southern California plant, which has been under adaptation and reconstruction during the past twelve months, is the only butadiene producer operated by a gas utility. The plant ranks with the largest of its kind and is the first big producer on the Pacific Coast. The plant was constructed under the direction of the Defense Plant Corp. and the Rubber Reserve Co. as a part of the national synthetic rubber program.

Commenting on the completion of the construction work at the plant, Mr. Masser said:

> "Initial steps looking toward the development of this project were taken in April, 1942, when technical engineers representing the Rubber Reserve Co. made a nation-wide survey of locations and plants potentially suitable for the production of butadiene and synthetic rubber. Finding that the Southern California Gas Co. had many of the facilities required for butadiene manufacture with a minimum use of new critical materials, government agencies entered into contracts with the Southern California Gas Co. for the necessary construction work and operation of the completed plant.
>
> "The existing equipment represents a value of approximately $6,250,000, and an additional $5,750,000 was required for new facilities and to build an absorption plant for the extraction of the crude butadiene produced."

J. G. Rollow is supervising engineer of the butadiene project, with W. W. Gaulka as his assistant. Guy Corfield is in charge of technical and chemical control problems and research. Grove Lawrence is in charge of operation and maintenance of gas manufacturing and compressor plants, and M. J. Cereghino is superintendent of butadiene gas production. K. G. Steinbeck will supervise the compressor, absorption, and dehydration plants.

The July issue of *GAS* will present an article prepared by Mr. Masser which will describe fully the construction and operation of the plant.

■ ■

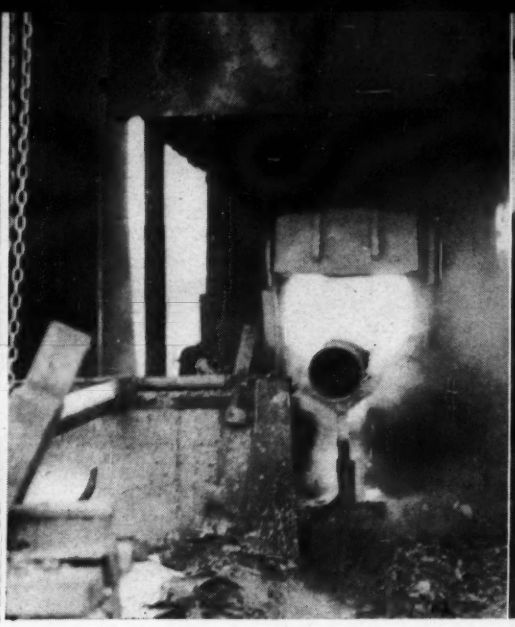
H. L. Farrar Named Trustee Of Technology Institute

H L. FARRAR, president of Coast Counties Gas & Electric Co., San Francisco, has been named to the board of trustees of the Institute of Gas Technology at Illinois Institute of Technology. Announcement of his election was made by Harold Vagtborg, director of the Gas Institute, following a meeting of the board on May 27.

Mr. Farrar is the only new member of the board of trustees. He replaces A. R. Bailey, formerly assistant to Mr. Farrar at the Coast Counties Co., who is now in the armed forces.

All officers of the Institute of Gas Technology were re-elected at the meeting. They include: Frank C. Smith, president of the Houston Natural Gas Corp., chairman; Henry T. Heald, president of Illinois Tech, president; Mr. Vagtborg, director; Robert B. Harper, vice president of the Peoples Gas Light & Coke Co., secretary; and Raymond J. Spaeth, treasurer of Illinois Tech, treasurer.

1. Pipe after 18 years' service. Pipe was painted, wrapped and again painted.



2. Length of pipe being put through blast furnace to loosen coated wrapping.

3. After its trial by fire, the pipe exterior then undergoes a scraping operation.

Reconditioned Pipe Will Serve Again

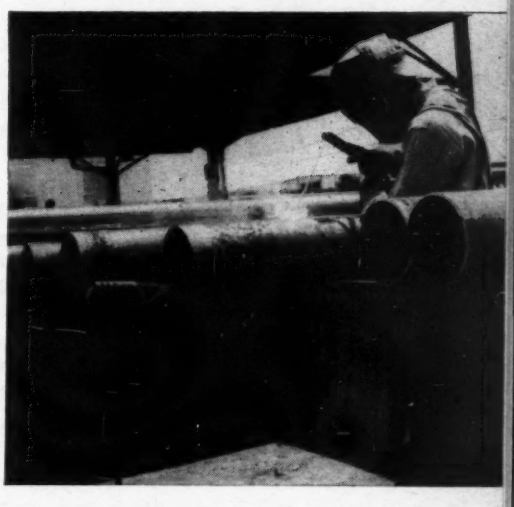
4. Typical areas of pitted pipe. Corrosion must be repaired to make pipe usable.

Photographs by

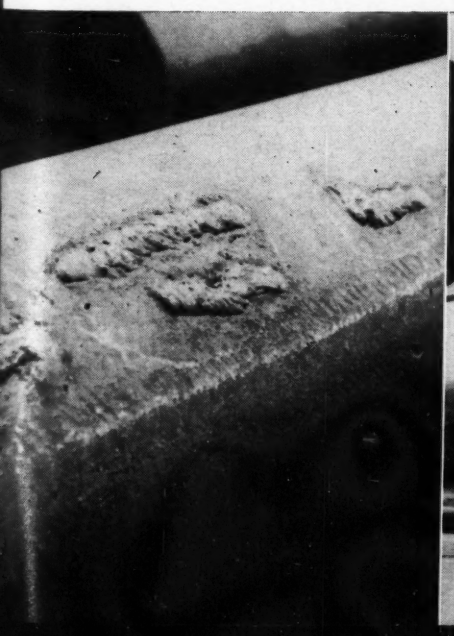
RUTH CANADY

Oklahoma Natural Gas Company

AS AN aid to the war effort, the Oklahoma Natural Gas Co., Oklahoma City, has perfected a method of reconitioning used pipe. This unearthed pipe, which has already seen many years of service, is then ready to again carry the flow of natural gas to where it is most needed—in the homes and war plants of the nation. The story of salvaging this still useful pipe is told by the accompanying pictures.



5. Spot welding pitted surface of pipe to stop leakage and strengthen pipe wall.



6. Pitted pipe is made serviceable by spot welding. (Welding job completed.)

7. Next step in the process is beveling the ends in preparation for welding.

8. The fully cleaned pipe stacked in the yard is now ready for service again

GUM PROTECTIVE DEVICES

For Gas Appliances

By F. E. VANDAVEER and MILTON ZARE

American Gas Association Testing Laboratories

INTERFERENCE with the performance of gas appliances due to pilot outages, resulting from gum-forming constituents in manufactured gases has been recognized for many years. Although ways and means for correction of this difficulty has been discussed on many occasions by various American Gas Association groups, first official action was taken by our approval requirements committee at its Oct. 6, 1939, meeting.

The approval requirements committee later authorized a comprehensive investigation of this problem. The American Gas Association Testing Laboratories were instructed:

1. To determine the need for gum protective devices for use with constant burning pilots and possibility of making them mandatory on domestic gas appliances for manufactured gas.
2. To investigate ability of contemporary devices to accomplish this function, and
3. To prepare requirements and methods of test to determine acceptable devices with a view toward adoption of appropriate listing standards incorporating them.

Research funds were provided in the spring of 1942 and experimental work was started soon thereafter. This project is now nearly completed. Data obtained to date are herein summarized.

Causes of Clogging

It has been authoritatively demonstrated that pilot clogging and outages in great numbers have been caused by vapor-phase gum in addition to dust, dirt, grease, sulfur and rust. Gum is the product of polymerization of gaseous constituents of manufactured gases which takes place in the storage and distribution system. Such gum-forming constituents have always been present in manufactured gases. However, they were not recognized as a major problem until automatic ignition and control devices, employing small gas ways in needle valve pilots, became popular on domestic gas appliances. These small gas ways afforded a ready location for deposition of gum particles.

From an examination of hundreds of clogged needle valve pilots obtained from installations in the field, previous investigators have found that vapor-phase gum was a contributory cause of 86.8% of such stoppages and the primary cause of 86.0%. By chemical analyses and subsequent synthesis they discovered that the deposits encountered resulted from polymerization and oxidation of various compounds in fuel gases, principally unsaturated hydrocarbons generally designated as illuminants. This process was no doubt accelerated by oxides of nitrogen in the presence of oxygen, both of which are present in manufactured gases leaving the source of generation.

In preliminary phases of our investigation, necessity of having unsaturated hydrocarbons, oxides of nitrogen and oxygen present in order to form vapor-phase gum was rather strikingly verified. Our manufactured test gas is produced by reforming natural gas. While it closely duplicates chemically coke oven gas, it contains relatively small amounts of illuminants, no oxides of nitrogen, and practically no oxygen. Addition of nitric oxide did not produce gum. Introduction of butadiene and nitric oxide produced traces of gum but too small an amount for our purpose Adding oxygen as well as butadiene and nitric oxide gave copious quantities of vapor-phase gum. By varying the concentration of nitric oxide, gum particles causing clogging rates of needle valve pilots equal to or exceeding those reported from field experience were obtained.

THIS STUDY of gum protective devices by Dr. Vandaveer and Mr. Zare was presented as a paper before the American Gas Association Technical Section Joint Production and Chemical Committee Conference held at the Hotel Pennsylvania in New York City on May 24 and 25. It would appear that this approach to the problem, and the general considerations presented, should apply also to the development of protective devices for pilots operating on any type of fuel gas that might carry impurities tending to plug small opening. Dr. Vandaveer is assistant director and Mr. Zare is research engineer at the Laboratories.—(Abstract by GAS.)

Since it has been shown that formation of vapor-phase gum necessitates the presence of unsaturated hydrocarbons, oxides of nitrogen, and oxygen and a certain aging period for growth of particles, the problem of eliminating gum difficulties resolves into two possibilities: (1) removal of one or more gum-forming constituents at the manufacturing plant, or (2) removal of gum particles at the appliance before they enter a pilot or point of restricted flow where they will be deposited. It would appear to be desirable to supplement plant control with auxiliary gum protective devices at the appliances, if complete freedom from pilot outages is desired.

Devices Investigated

In order to determine whether contemporary devices effectively remove gum and how long they will continue to do so, new samples of every known device were investigated. A number of units which had been in service from one to six years were also obtained. A brief description of the new units is presented in Table 1. They are shown connected to a gas manifold and pilots in Fig. 1. Products of eight different manufacturers are represented. Fourteen of the 17 units received were specifically designed to filter gum. The remaining three were designed primarily to remove dust particles and were included in this study for comparative purposes. The 21 used gum filters, which had provided satisfactory service on consumers' appliances of from one to six years represented a wide range of capacities and application to all types of domestic gas appliances.

Briefly, the test procedure followed and apparatus employed in studying performance of these devices was essentially similar to that described by J. A. Perry. Our apparatus is shown in Fig. 2. Butadiene, nitric oxide, and oxygen are added in measured volumes to the Laboratories' manufactured test gas from the glass siphon bottles shown in the rear. This resulting mixture is then aged in the 40 cu. ft. tower shown on the left for approximately two hours to permit gum formation and then

passed through the filters located on the test manifold shown in final form in Fig. 1.

By adjusting the amount and concentration of nitric oxide added, it was possible to control the clogging rate of Rutz lighters and number of gum particles at the outlet of the aging tower. At the highest rate of gum generation it was possible to completely close Rutz lighters in about 20 minutes time. Almost any slower rate of stoppage could be secured by proper manipulation. For continuous testing of filters, a rate of clogging of needle valve pilot within one-half to two hours was employed. This may be compared with the most extreme instance of stoppage reported in the field of four hours. To attain this fast rate of gum formation an ageing period of about 2.2 hours was employed using a mixture of our manufactured gas to which approximately 1.2% (of total volume of gas) butadiene, 0.6-0.8% oxygen, and 80-120 grams of nitric oxide per million cu. ft. had been added.

Tests for Gum

Tests, conducted to determine the amount of gum present in the gas passed through the gum filters, were made in several ways. The one used for control purposes and a most practical method was to pass gas from the outlet of the aging tower through an unprotected needle valve and then to burn it at a pilot port. The time required to completely clog the valve, as shown by extinguishment of the pilot flame, gave a direct indication of the amount of gum in the gas. Deposits on the valve needle were inspected by employing a microscope. These deposits were soluble in dilute alkali and decomposed violently on heating.

Another method of gum determination made use of the Tyndall beam tester loaned by the United Gas Improvement Co. This instrument (shown in Fig. 1) permitted visual inspection of gum particles in the gas stream, as well as determination of their number and size. Gas from the aging tower could be passed through a specially designed black-body cell into which a thin beam of intense light from an arc lamp was admitted. If particles of gum were present, their diffraction of the light would be visible to the eye in the same manner as dust particles appear to dance in a ray of sunlight.

A small microscope having a magnification of 100 was used with the Tyndall beam tester for the purpose of counting the number of particles in a given area. Size of gum particles from approximately 0.5 (0.0000195 in.) to 1.5 microns (0.0000585 in.) diameters were estimated. Smaller particles could be seen but they could not be evaluated with our equipment.

The minute size of vapor-phase gum particles permits them to remain dispersed and suspended in a gas. As is well known, they can be carried throughout an entire distribution system. Smallest particles reported as observed with an ultra-microscope are 0.1 micron (0.0000039 in.); the largest that will remain suspended in gas are 1.5 microns (0.0000585 in.) diameter. The average is estimated as 0.26 microns (0.00001 in.).

These dimensions become more significant when compared to the small openings of gasways in automatic pilots and needle valves. Assuming the opening around a needle adjustment passing 0.2 cu. ft. of gas an hour to be truly concentric, its width has been calculated as 0.00028 in. Where these needles are off-center, their openings may vary from zero to 0.00056 in. It is possible therefore that a portion of the needle valve opening is no wider than the diameter of some of the gum par-

TABLE 1

Description of devices designed to prevent stoppage of small gasways in pilot valves, thermostats, and other gas appliance accessories from vapor-phase gum or dust as employed in this investigation.

Manufacturer	*Filter*	*Filtering Media*	*Manufacturer's Capacity Cu. ft./Hr.*	Remarks
1	A	Specially prepared mineral wool	0.75	(1) Designed mainly for range top burner pilots
	B	"	10.0	(2) For refrigerators, water heaters, etc.
2	C	"	0.75	(1)
	D	"	7.0	(2)
	E	"	10.0	(2)
3	F	"	0.75	(1)
4	G	"	0.75	(1)
	H	"	5.0	(2)
5	I	Wool felt	50.0	For dust protection, individual appliances
	J	"	160.0	For dust protection, house lines
6	K	Commercial glass wool		(1)
7	L	Wool felt		For dust protection, refrigerators
8	Ma	E. R. wool felt filter and thin plate orifice	Depends on fixed orifice	For range pilots, water heaters, refrigerators
	b	"	"	For range pilots, water heaters, refrigerators
	c	Thin plate orifice	"	To replace pilot tips
	d	"	"	To replace pilot tips
	e	"	"	To replace needle in Rutz lighters

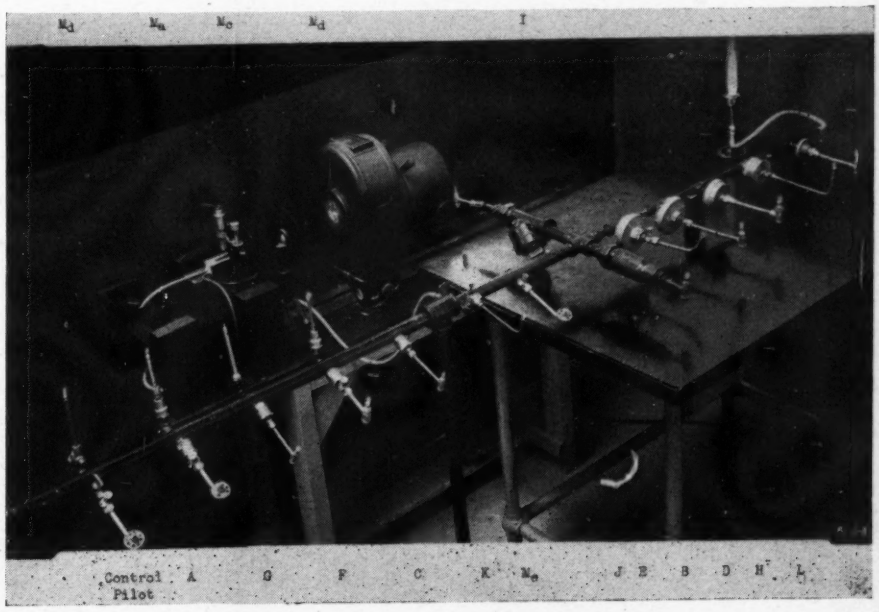


FIG. 1. Test manifold for gum protective devices showing various types studied and Tyndall beam apparatus.

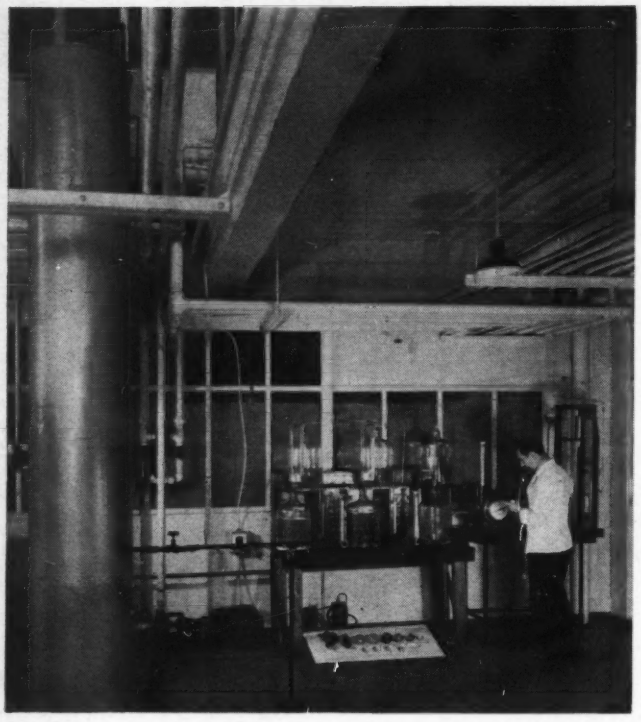


FIG. 2

Apparatus for adding gum-forming constituents (butadiene, nitric oxide, and oxygen) to manufactured gas supplied to 40 cu. ft. aging tower (at left), where gum is formed. Gas containing gum is passed through gum protective devices on manifold.

ticles, whereas the largest opening is only approximately 10 times greater than the diameter of the largest particles. It is to be expected therefore that gum particles would lodge in these small openings and ultimately close them completely.

Having established the fact that gas containing gum in controlled quantities and of a given particle size and number could be generated continuously, that the test could be accelerated to permit a reasonable time for complete closure of small filters under conditions similar to those existing in service, and that the results of filter tests would be directly applicable to field conditions regardless of chemical composition of the gum, life tests to determine the effectiveness of the various gum protective devices for removing gum were undertaken.

Filters Installed

All filters were installed on the test manifold with needle valve pilot attached at their outlets as shown in Fig. 1. Some contained fixed orifices and therefore did not employ a needle valve. After adjusting the gas rate on each pilot to 0.25 cu. ft. per hour, gas containing a known nitric oxide concentration and having a clogging rate of one-half to two hours average 1.2 hours for unprotected Rutz lighters was supplied. All pilots were then operated continuously for several months until gum deposits completely closed their attached needle valves or each device itself became clogged. In this manner, life-service expectancy of each unit was determined. In addition, periodic determinations of pressure drop through each unit were made for the purpose of measuring their reduced filtering capacities. A second method of test employed to determine effectiveness of gum protective devices at periodic intervals was also conducted. Samples of gas taken from the outlets of each filter on the test manifold were observed in the Tyndall beam tester. Where gum particles were visible, it was apparent that they were not being removed and would ultimately cause closure of the pilot.

Results obtained to date are graphically summarized in Fig. 3. It will be readily apparent that there is a wide variation in the degree of protection afforded by these various units. Filters A, C, F and G have the longest effectiveness, providing protection for a period corresponding to 1031 Rutz lighter stoppages; filter K, 200 Rutz lighter outages; and type M devices, 60 stoppages. Filters I, J and L permitted pilots to become clogged in the same time as the unprotected control pilot and therefore did not remove gum. As this last group was designed primarily for dust particle removal, their failure to remove gum is not an accurate measure of their usefulness to remove large entrained dust particles. Tests on filters B, D, E and H, which are designed for larger gas flows, have not yet been completed and therefore are not included in Fig. 3.

Obviously, the most satisfactory pilot protective device for eliminating service difficulties from vapor-phase gum would be one which would prevent gum particles from passing through it or from being retained in small gasways, and yet continue to function without an appreciable decrease in its effectiveness for an indef-

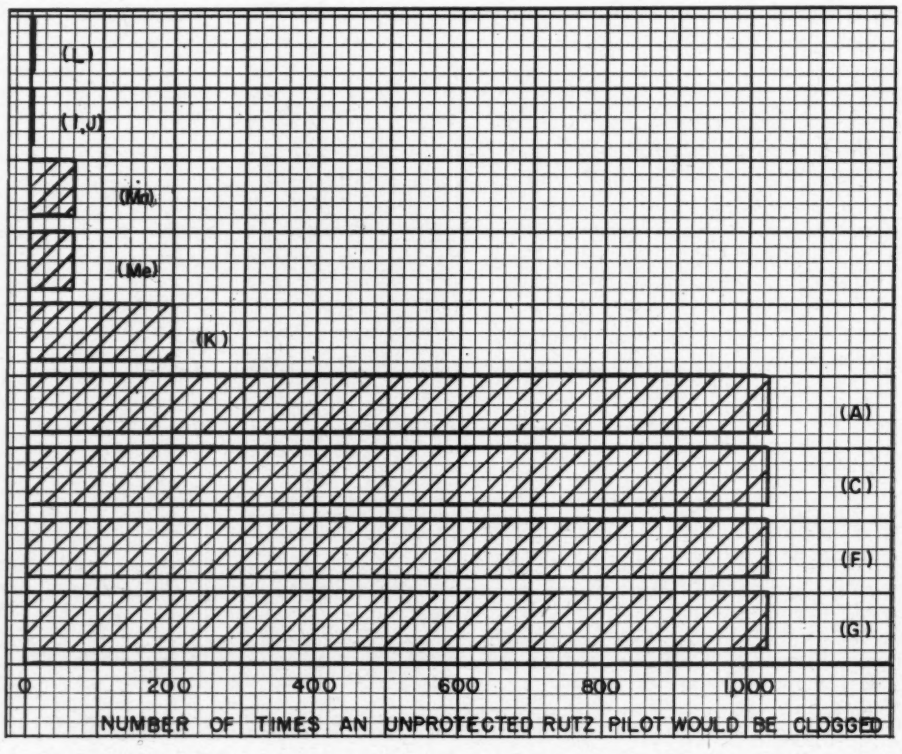


FIG. 3. Comparison of effectiveness of various gum protective devices to prevent pilot outage with an unprotected Rutz pilot operating on the same gas.

inite length of time. Closest approach to this ideal is attained by filters A, C, F and G. It is interesting to note that these units are practically identical in construction and contain the same specially treated mineral wool filtering material. In all probability, the mesh formed by the fibers are so fine, the diameter of certain fibers are so small, and the fitting of parts so accurate that nearly all gum particles which would otherwise be deposited are prevented from passing through the filter.

No Gum on Needle Valves

This theory is supported by the fact that no gum particles were found on needle valves, even after the units themselves had become closed with gum. Exterior and interior views of units of this type are shown in Fig. 4. The device shown was taken apart after it had been clogged in a period corresponding to 1031 Rutz lighter outages. It may be seen from the color and texture of the filtering material that there is an abundance of gum at the inlet (right) end. This dark color extends a short distance into the mineral wool, although the outlet and (left) has not changed in color. This further indicates that no gum has passed through the device.

Another type of design is represented by filter K. In this filter long strands of commercial glass wool fibers, wrapped around a spring coil, are used as the filtering medium, its density being subject to manual adjustment. For example, two units as secured from the manufacturer had different gas flows; one was adjusted for 1.2 cu. ft. per hour, the other 0.8 cu. ft. per hour at 0.5 in. water column pressure drop. As indicated by the uneven gum deposits on the glass wool coil, this construction does not provide uniform distribution of the filtering material. Gum deposits were also formed at the elliptical opening of the B valve, as well as at the pilot tip provided, thus indicating that all gum particles were not collected by the filtering material. Data included in Fig. 3 were obtained with the 0.8 cu. ft. unit.

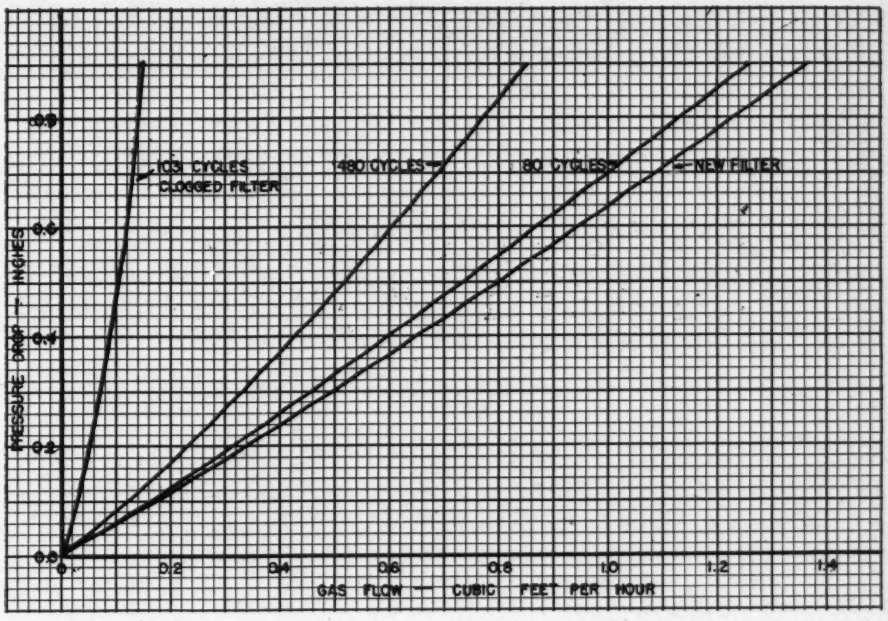


FIG. 5. Showing decreased gas flow resulting from saturating filter C with vapor phase gum particles.

Filters I, J and L, designed for dust removal, were not found satisfactory as gum filtering agents (see Fig. 3). As pilot stoppages occurred at the same rate as unprotected pilots, it is evident that the formed wool felt pads were not effective. Operating on an entirely different principle, the devices designated as type M are intended to minimize surfaces on which gum particles may be deposited and to maintain as large a passageway for pilot gas as possible. Thin stainless steel plate fixed orifices are used. They are designed for use as pilot burner tips as well as orifice restrictors.

When subjected to gas containing gum similar results were obtained with both types of installations. As shown in Fig. 3, they withstood the equivalent of 60 outages of unprotected Rutz lighters before becoming completely closed. These devices designated as Ma and Mb in Fig. 3 incorporate B valves. Although instructions received with them specify that the B valves be employed for servicing purposes only, it is possible that they may be used for adjustment of the gas rate and, therefore, tests were conducted with these valves both open and partially closed. With the B valve line partially closed, stoppage occurred at the elliptical opening between plug and barrel, whereas it occurred at the orifice when valve was not used. It is interesting to note that complete stoppage with gum occurred in the same time, with or without partial closing of B valve.

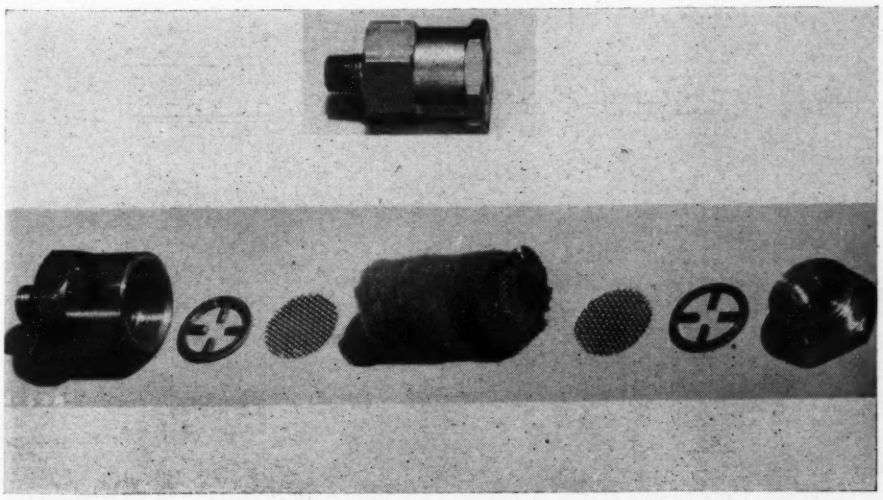


FIG. 4. Typical construction of pilot filters A, C, F and G showing condition of interior after complete clogging with vapor-phase gum. Thin dark area on inlet (right) is gum deposit.

Pressure Drop Taken

Pressure drop determinations were made before tests were started on each unit and periodically thereafter during the course of the tests to obtain an indication of clogging of the filter and its remaining filtering capacity. Data obtained with filter C, which is presented graphically in Fig. 5, is also typical for filters A, F and G. For example, with a pressure drop between inlet and outlet of the device of 0.5 in. water column the gas flow was 0.8 cu. ft. per hour on the new filter, 0.73 cu.

FOR Unbroken

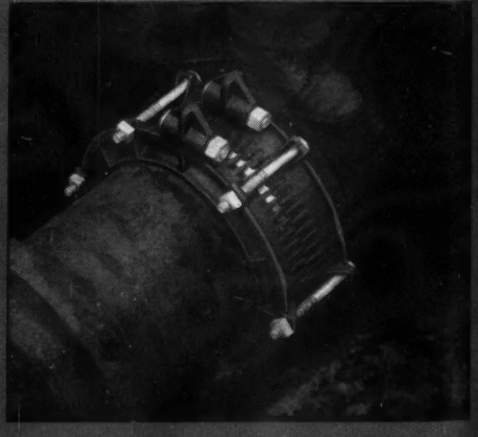
IN SPITE of the scarcity of new pipe, you can maintain uninterrupted distribution by repairing all leaks and breaks in mains with SKINNER-SEAL pipe repairs.

The government recognizes the immense importance of this service. Under present conditions, however, it will help us if you will check over your summer clamping program early, and let us know what sizes you expect to order. This will aid us in the buying of raw materials under our CMP allotment and enable us to maintain reasonably prompt deliveries.

You see, most of our machines are working three shifts, seven days a week, on ordnance and other war material, and we have to plan production of our own line well ahead. Remember, when you use a clamp, you save a length of pipe.

SKINNER-SEAL EMERGENCY PIPE CLAMPS. For stopping leaks in steel or cast iron pipe lines, instantly, permanently. Sizes 1/2" to 12". Pages 10-11, Catalog No. 41.

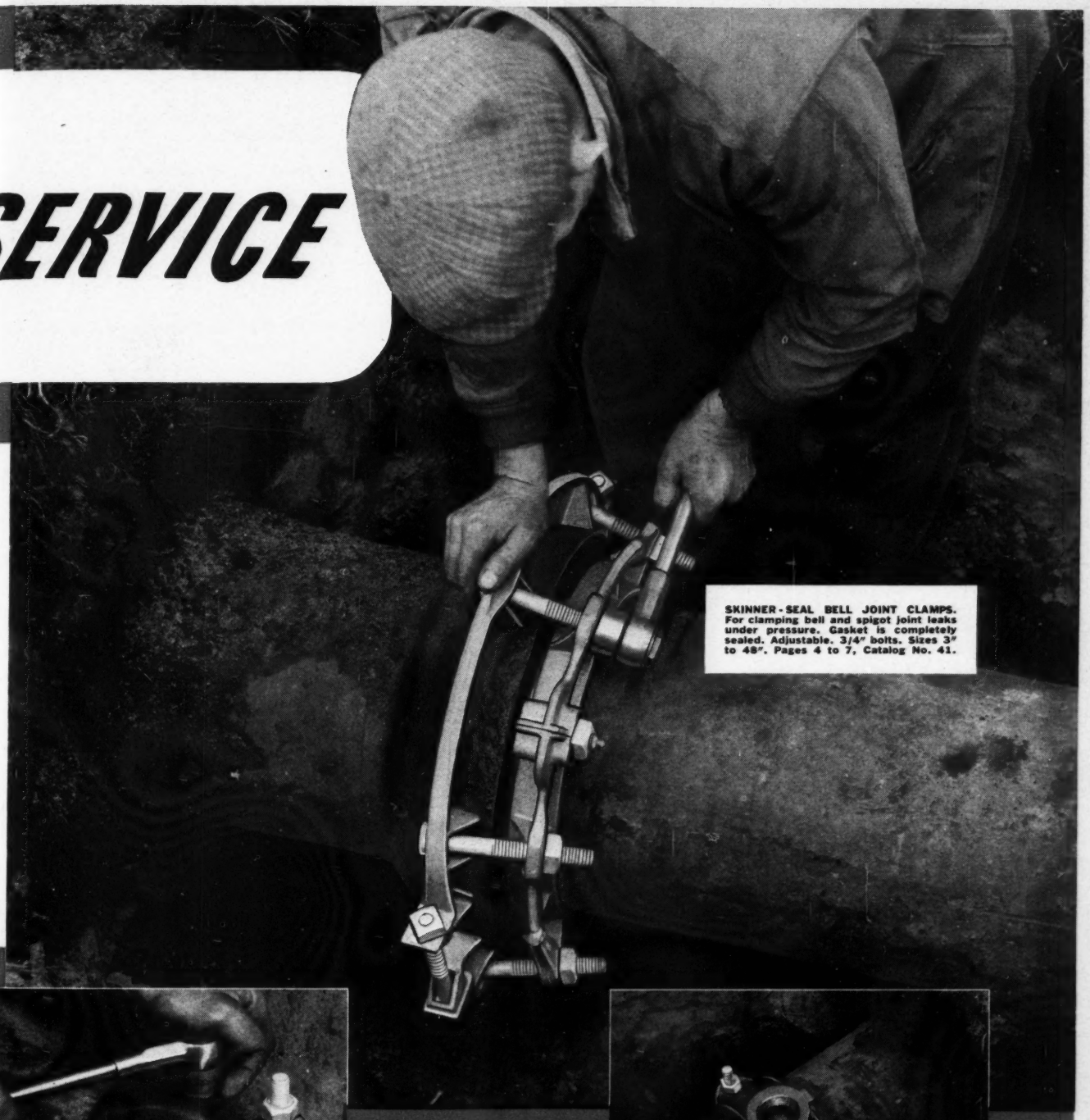
SKINNER-SEAL PIPE LINE CLAMPS. For repairing long splits or very bad corrosion in pipe lines. Tremendously strong—for highest pressures. Pages 12-13, Catalog No. 41.



SKINNER-SEAL SPLIT COUPLING CLAMPS. For instantly repairing clean breaks in cast iron mains. Sizes 2" to 16". Pages 8-9, Catalog No. 41.

WRITE OR WIRE — M. B. SKINNER C

SERVICE



SKINNER-SEAL BELL JOINT CLAMPS. For clamping bell and spigot joint leaks under pressure. Gasket is completely sealed. Adjustable. 3/4" bolts. Sizes 3" to 48". Pages 4 to 7, Catalog No. 41.

SKINNER-SEAL PRESSED STEEL ECONOMY CLAMPS. For badly pitted or corroded pipe lines. Pages 20-21, Catalog No. 41.

IF YOU HAVEN'T OUR No. 41 CATALOG WE'LL GLADLY RUSH ONE TO YOU BY RETURN MAIL.

SKINNER-SEAL SERVICE SADDLES. Tremendously strong. Sizes 1-1/4" to 12"—steel or cast iron pipe. Pages 24-25, Catalog No. 41.

R CO., SOUTH BEND, INDIANA, U. S. A.

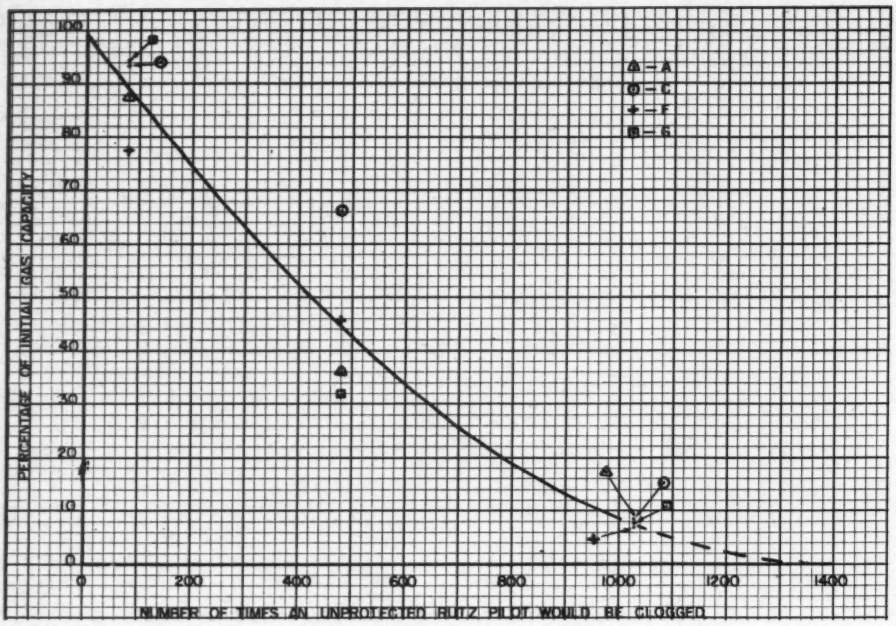


FIG. 6. Illustrating reduction in capacity of filters A, C, F and G with increase in number of unprotected pilot outages.

ft. after 80 cycles (1 cycle equals 1 closure of unprotected Rutz pilot), 0.52 cu. ft. after 480 cycles, and only 0.1 cu. ft. after 1031 cycles, causing complete stoppage.

The average gas flow expressed in percentage of initial capacity of filters A, C, F and G were practically identical. They were calculated and plotted against the corresponding number of times a Rutz lighter would become clogged in the same period of use as shown in Fig. 6. This curve might also be considered as representing the life-service expectancy of this type of filter as compared to an unprotected Rutz lighter. If, for example, a Rutz lighter is clogged in actual service, approximately once every five days, then these filters should provide more than 14 years of protection. Assuming extreme conditions in the field, these filters should provide protection to a constantly burning pilot for 172 days.

To indicate how satsisfactory filters of the type represented by A, C, F and G performed in service, pressure drop capacity measurements were made on 10 devices of pilot size that had been providing satisfactory performance for periods of one to six years. Capacity of each unit when new was not available, therefore the degree of closure could not be plotted. The least capacity with 0.5 in. pressure drop of three filters in service more than five years was 0.36 cu. ft. per hour, three to four years, 0.48 cu. ft., and less than two years, 0.62 cu. ft. per hour. Rough estimates of the ratio of decreased capacity indicated that half the capacity of the filter was rendered non-effective in approximately 6⅔ years.

Summarizing, it appears that:

1. There is need for gum protective devices for automatic pilots operating on manufactured gas.

2. Contemporary devices are available which will satisfactorily remove gum for many years without need for servicing.

3. Requirements and methods of test which will insure acceptable gum protective devices can readily be formulated.

4. Incorporation of such requirements in standards covering gas appliances and accessories and their early application now seems highly desirable.

■ ■

West Cement Gas Field Now Producing 50% of Allowable

The first results of tests following the shutting down of wells in the West Cement gas field in Caddo County, Okla., has resulted in the issuance of a temporary order by the Oklahoma Corporation Commission restricting the gas wells to production of 50% of their allowables based on production for the last 15 days of April. The commission is to hold further meetings to determine if other steps should be taken, based upon results observed in the 14-day shut-down. (*GAS*, May, 1943, page 72.)

The shut-in tests were made by engineers of the U. S. Bureau of Mines aided by Elmer Capshaw, newly appointed engineer of the oil and gas conservation department of the Oklahoma Corporation Commission. The shut-in was recommended by Walker T. Pound, conservation officer of the commission.

■ ■

Million Man Hours Spent Filling Government Forms

According to a recent report filed by the Mid-West Utilities Commissioners Committee, almost a million man-hours were spent by 58 utilities in six states during the first eight months of 1942 compiling special reports for the various governmental regulatory bodies. A. B. Hill, chairman of the Arkansas Utilities Commission, headed the special survey committee.

The report is the result of a man-power survey by 58 major utility companies in Oklahoma, Kansas, Missouri, Arkansas, Louisiana and part of Texas. It states that 58 utilities consumed 731,766 man-hours and spent $5,033,712 in making routine original cost study reports for the Federal Power Commission. An additional 112,039 man-hours were required to compile other FPC reports during the same eight-month period. Reports for state and municipal regulatory bodies required 25,722 man-hours. The WPB required 10,516; Securities and Exchange Commission, 19,493; War Department, 1132; and other federal agencies, 7353.

■ ■

New Underground Crossing For Southern Counties

The War Production Board has authorized Southern Counties Gas Co. to proceed with a new underground crossing for its 12-in. Ventura transmission pipeline at Sespe Creek near Fillmore, Calif. This new underground crossing was deemed necessary when the line, one of the three which brings gas supplies to Los Angeles, was endangered by flood waters in the severe January storms. The pipe has been temporarily strung across the highway bridge which supports a transmission line of Southern California Gas Co.

The project, cost of which is estimated to be $11,000, is to include the installation of approximately 2000 ft. of 10-in. heavy sidewall piping below the stream channel. The line will be tied-in with the Southern California Gas Co. line on each side of the crossing, permitting the maintenance of supply through both lines in case the overhead portion of the Southern California Gas line is destroyed.

■ ■

SEC Approves Laclede Gas Recapitalization Plan

The plan for recapitalization of the Laclede Gas Light Co. of St. Louis, a subsidiary of Ogden Corp., has been accepted and approved by the Securities and Exchange Commission as presented by the Ogden Corp.

According to the plan, Ogden proposes to dispose of all its subsidiary companies which are registered holding companies or public utility companies, provided such investments shall not be affected by the sale of securities prior to the recapitalization of such companies in compliance with specific clauses of the Holding Company Act. The proposal is that the Laclede Power & Light and Laclede Gas Light Co. would sell for $8,600,000 the electric properties operated by the Laclede Power & Light Co. to Union Electric Co. of Missouri. Then the Laclede Gas Light Co. would recapitalize and simplify its corporate structure.

■ ■

Over One Million War Housing Units Constructed

More than 1,100,000 new housing units for occupancy by essential war workers have been placed under construction since the start of the defense program in July, 1940, National Housing Administrator John B. Blandford, Jr., announced on June 5.

A total of 813,000 accommodations had been completed by the end of April, and 309,400 additional units were in the process of construction. During the first four months of this year some 180,000 units were completed and 186,000 others started.

Keeping Gas Appliances at their War Jobs

By J. H. COLLINS

General Superintendent, Gas Department, New Orleans Public Service, Inc.

MODERN gas conveniences, while bringing comfort and pleasure to the customer, have materially increased the number of service calls answered by the utilities. The utilities in their desire to give the public a full measure of service during the introductory period, when these types of appliances were relatively new to our customers, bent to their task with all the experience, ingenuity and equipment at their command.

Then came Pearl Harbor!

To effect the transposition from a peace-loving country to an efficient war machine required the sapping of manpower from industry, the converting of material into war machines, and the utilization of fuel, power, and equipment to a maximum extent in war-time industries.

Problems Faced

The utilities took stock of the situation. They were faced with many problems. Their part in this great drama was to furnish fuel to cook and heat in homes and camps, and to keep the production wheels turning in industry. The following problems had to be faced:

1. Loss of manpower to armed forces and other war industries.
2. Necessity of conserving equipment and material, such as rubber, gasoline, metal products, etc.
3. Inability of plumber and dealer service organizations to meet the service problems due to loss of manpower and the curtailment of the use of equipment.
4. Inability of the consumers to purchase new appliances and, in many instances, repair parts for those in use, thus making it necessary to take every precaution to prolong the useful life of the appliance.
5. The necessity of conserving gas fuel by the continuous efficient use of this commodity.

The utilities, in order to operate and maintain their system under these conditions, must of necessity look to the consumers to assume much of the care of their gas equipment in order to assist in this war effort, and to materially benefit themselves by the saving to be derived by a more thorough understanding of the operation and maintenance of their equipment.

The modern type of service requests may be divided into two classes:

First: Those because of their nature requiring an investigation by the utilities:

1. Leaks, either in the main or service piping, meter, customer fuel piping, or appliances.
2. Insufficient gas supply, either a total outage or a poor supply caused possibly by a stoppage in main, service, or customer fuel piping.
3. Meter trouble, causing poor supply, noise, etc.

Second: Service calls pertaining to the customer's appliances:

1. Lighting of pilots on ranges, water heaters, space heaters, heating systems, or refrigerators.
2. Trouble with water heaters or other appliances caused by defective mechanisms, dirty coils, faulty vent installations, fumes from poor combustion, etc.
3. Requests to clean and regulate space heaters and other heating appliances such as floor furnaces, unit heaters, or central heaters.
4. Those caused by inadequate house-heating or water-heating capacity.
5. Lack of knowledge in operating appliances.
6. Requests to clean and regulate burners on ranges, laundry stoves, etc.

There are many consumers who had always by their own efforts kept their appliances operating effectively and efficiently. There were others who, because of lack of understanding or interest, had not.

The problem then would seem to be one of education. To instruct consumers where necessary in the care and use of their equipment, including the lighting of pilots, placing equipment in operation; cleaning burner ports, burner throats, and primary air openings on burners of gas ranges, space heaters, and similar simple appliances; and, where possible, air and gas adjustment on such equipment. This training may be also carried further to educate the customer in the cleaning and regulation of appliances. How may this be best accomplished is a question to be answered by the individual company with its understanding of local problems.

The method used by many of the companies in the training of their own and plumber and dealer servicemen, whereby classes, including both laboratory and theory, are conducted in the company training school, does not readily lend itself as being practical due to the number of people to be trained, and the accompanying difficulties.

Let us briefly consider some of the methods or combination of methods which might prove practical.

Training Methods

Four methods of training that might be used are:

(1) Demonstrations before various clubs, groups and organizations. This training may be conducted by servicemen, home service girls, or a combination of both, giving a lecture and practical demonstration, using sample types of the more general makes of appliances, such as a range, space heaters, etc.

The classes may be conducted in the meeting room of the individual organization, such as in a school where the parents' or mothers' club assembles, in the church where an organization may meet, or in the auditorium of the public service company should it be advantageous to arrange such club meetings there.

It is possibly advantageous to arrange such demonstrations in conjunction with the regular meetings of the organizations. If this is not practical, and special meetings must be held, it may be advisable to offer prizes or other inducements to increase attendance.

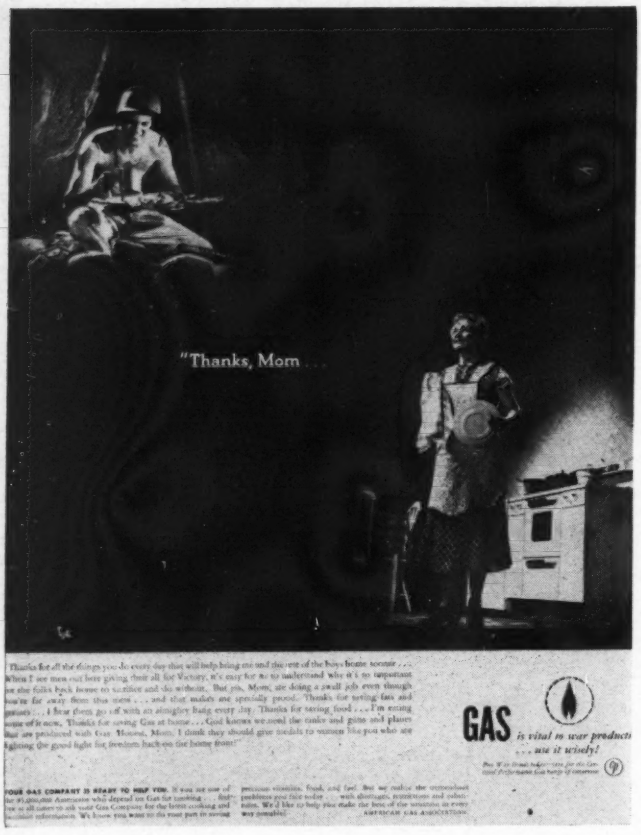
Teaching the housewife, rather than the husband, will possibly come nearer to achieving the purpose on appliances such as kitchen ranges.

(2) Conducting continuous demonstrations in the lobby or salesroom of the utility office building either by demonstrations on representative appliances by servicemen, home service girls or salesmen, combined with lecture, or by the use of moving pictures, slides, etc.; or a combination of both.

This has the apparent advantage of reaching a large number of customers visiting the lobby to pay their bills. However, unless some form of attraction is used to draw their attention to the demonstration, this method will not achieve its purpose alone.

(3) House-to-house instruction by servicemen, using the customer's own

*Reprinted from an article, "Keep Gas Appliances on the Firing Line," published in the Southern Gas Association Progress.



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The gas industry's national magazine ad, "Thanks Mom," has been selected by the Office of War Information and the Advertising Council as one of 50 outstanding advertisements which has helped the cause of civilian mobilization. The "Thanks Mom" ad appeared in the Saturday Evening Post for March 20, Life for March 22, and Collier's for March 27. Immediately following these appearances, the Committee on National Advertising and the adverising agency, McCann-Erickson, Inc., were the recipients of many congratulatory messages.

▲

appliances as a training medium. This system would produce the best results from the standpoint of educating each and every customer on his particular appliance. This method, however, in large or medium sized properties would prove costly and entail calls at homes where perhaps such training was not necessary. It might also, eventually, increase greatly the number of service calls on the utility. However, it may be possible to carry on such a program as a fill-in for the sales force should manpower be available.

(4) Training of consumer by serviceman at time of answering a service request, augmenting this training by presenting the consumer with a copy of a pamphlet describing the cleaning and regulation of burners, the lighting of pilots, etc., in as simple terms as possible, and illustrating the printed matter with as many cuts of representative appliances or parts of appliances as is practical.

The serviceman, when presenting the pamphlet, explains its purpose, and briefly discusses the subject matter, partly reading from the book as he does so.

This method has the advantage of reaching the customers in need of such training, using the regular service group in performance of their normal duties at a relatively small additional cost.

The instruction pamphlet idea may be effectively used in each of the methods described. A combination of methods may also be used to advantage.

Method No. 4 is now being used by the New Orleans Public Service, Inc.

A pamphlet, "How to Care for Your Appliances," is distributed by the servicemen of this company, who instruct the customer while answering the service call, present them with the pamphlet, and explain the contents briefly.

Reference in the pamphlet is made to only the simple appliances in general use, as it is believed that it is not practical to instruct a customer in the care of the more intricate appliances, except by personal demonstration, unless a pamphlet of such proportions as to cover all types of appliances could be compiled. This, we believe, is beyond the scope of this program.

The response from the public has been most gratifying, many expressing themselves very enthusiastically as to the need for such a booklet. Rechecks have proved that the consumers are wholeheartedly entering into the spirit of such training and are making a sincere effort to perfect themselves in the proper care and use of their appliances.

It is hoped that this training may have a far-reaching and lasting effect, and prove of material aid in creating in our customers a better understanding and appreciation of gas—the ace of all fuels.

John Bogan Leaves AGAEM to Join Cribben & Sexton

John E. Bogan, sales promotion and advertising director for the Association of Gas Appliance and Equipment Manufacturers, has joined the firm of Cribben & Sexton. Co., Chicago, as general sales manager and war contract coordinator. G. D. Wilkinson, president of the manufacturers of Universal gas ranges, announced Mr. Bogans' new appointment to his company.

John E. Bogan

Mr. Bogan, well-known in the appliance promotion and merchandising field, first joined AGAEM in 1939 as national counsellor and was promoted in 1940 to sales promotion and advertising director of that organization.

The new Cribben & Secton executive is the author of the Deferred Delivery Freedom Merchandising Plan now awaiting approval by the Treasury in Washington. The basis of this plan is to sell war bonds committed to the future purchase and delivery of durable goods in the post-war period. He is also the author of the CP Range Portfolio entitled, "Once Upon a Time," which won the International Direct Mail Advertising Award. Three years ago in Hollywood, he publicly-engineered the national impetus for the movie and radio phrases, "Now You're Cooking With Gas," and "What's Cooking."

■ ■

Gas Institute Reveals Plan to Publish New Quarterly

The first issue of "Gas Technology Review," a quarterly published by the Institute of Gas Technology, will appear early in July, according to Julian F. Smith, technical librarian. Plans for the publication of this new bulletin, which will review papers from the technical press, were completed at a meeting of the board of Institute trustees held on May 28, when it was decided that the magazine should be a quarterly for at least its first year.

The subscription plan is that member companies will receive copies free for the first year, while non-members will be charged a moderate subscription rate.

"Gas Technology Review" is to serve as a medium of exchange for domestic and foreign periodicals on subjects related to the gas industry.

■ ■

Servel Employees Receive Special Safety Award

A special award for Distinguished Service to Safety was presented to the men and women employees of Servel, Inc., Evansville, Ind., Saturday, June 12, in recognition for their remarkable showing in establishing a lost-time accident record which was greatly below the average for industries performing similar operations during 1942. This is not the first award given to Servel employees by the National Safety Council, who select the winners.

The award is in the form of a plaque, and was presented to Dr. Thomas Dobbins, medical and safety director of Servel who accepted in on behalf of the employees. The presentation was made by Daniel Thompson, chief of the radio section, National Safety Council.

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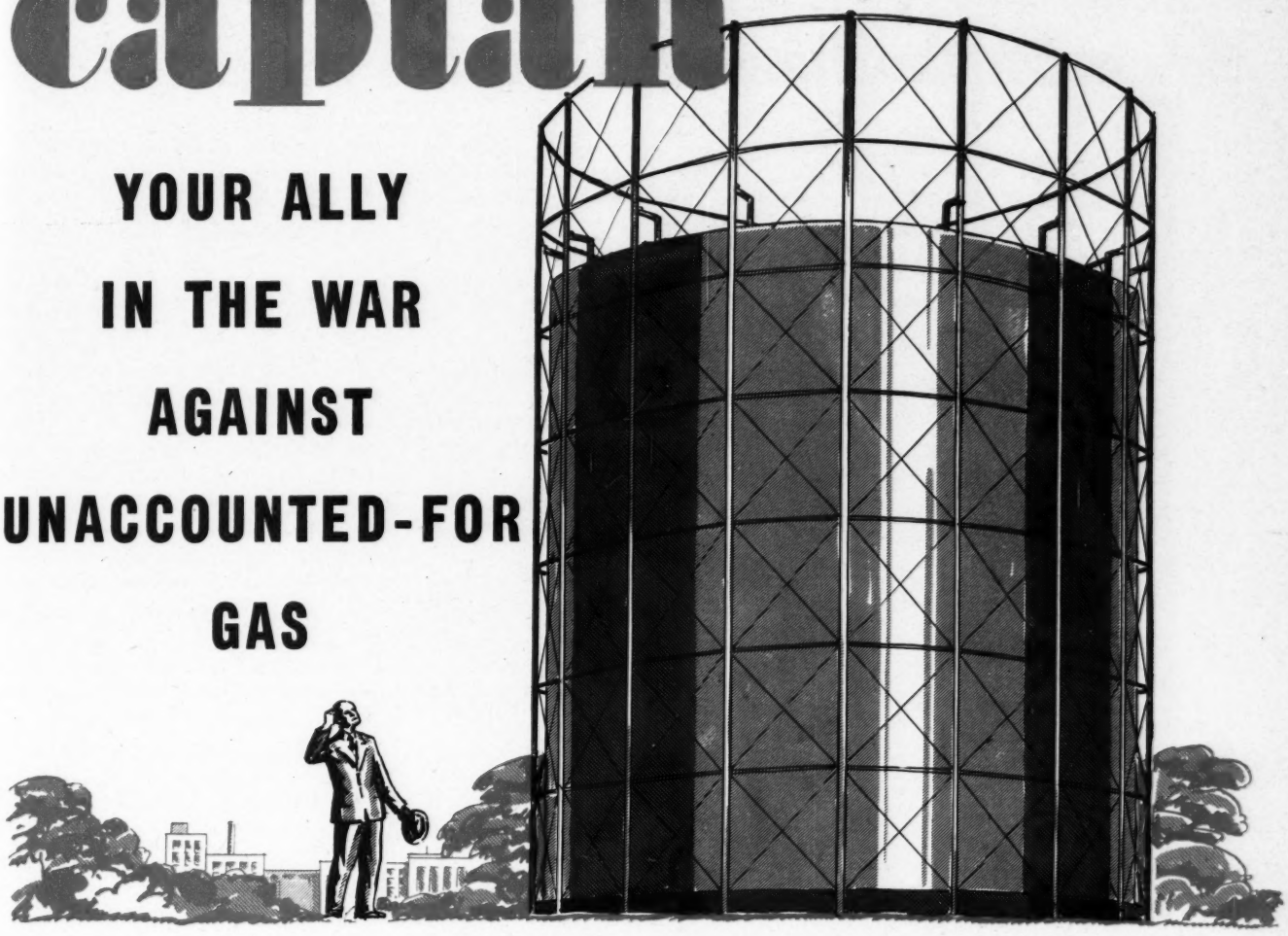
YOUR ALLY IN THE WAR AGAINST UNACCOUNTED-FOR GAS



captan *Advantages*

1. GAS-LIKE SMELL
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4. HARMLESS
5. ECONOMICAL
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7. UNIFORM
8. DOESN'T FADE OUT

TODAY the use of odorization plays a doubly important roll in gas distribution operations — it reduces the amount of unaccounted-for gas, and helps prevent explosions due to escaping gas.

Used regularly, Captan guarantees dependable odorization to the extreme ends of the distribution system. Look over the Captan advantages listed in the panel at the left — then write us and ask an engineer to tell you how Captan can help you in these days of heavy demands on the gas industry. You will profit by it. No obligation, of course.

captan

NATURAL GAS ODORIZING CO.

—the NATURAL Gas Odorant—

LOUISIANA NATIONAL BANK BLDG., BATON ROUGE, LOUISIANA
PEOPLES GAS BLDG., CHICAGO, ILLINOIS

Points for the Dealer in Appliance Servicing

SERVICE is no longer a necessary evil designed to keep the customer happy and promote sufficient good will to get another sale. Today service becomes the real thing, something to hang your hat on. The dealer who wants this business will have to sell it just as he used to sell his appliances. Primarily his service should be one of a mechanical nature rather than one of trying to sell replacement parts. For parts that were normally easy to obtain may become difficult to get due to shortages and the many changes in manufacturing plants necessitated by conversion from peace time to war production.

The following suggestions point out what should be done:

1. List your company in the classified section of the phone book under "Gas Appliance Repairs" or "Ranges" or both. Take enough space to command attention.

2. Send out a letter to your complete mailing list advising them of this new and efficient repair service.

3. Set up nominal charges for certain types of service; such as, complete top burner, oven and broiler adjustment service; refinishing of top burners, oven racks, etc. In servicing, when at all possible, repair the damage rather than attempt to replace with new parts. This is to conserve materials—to "Fix It Up and Make it Work."

4. Give prompt and efficient service. Don't fall down on your promises. Some little extra service while your man is on the job can well afford to be done.

5. While he is there, the serviceman should make a survey of the customer's needs for future reference. Sell your future services.

6. Train your men to be tactful and diplomatic.

7. Train your men to be courteous.

8. Be sure to diagnose the complaint correctly, explaining the necessary work to the customer.

9. While working, keep conversation at a minimum.

10. Avoid undesirable discussion with customer. Don't refer to gas leaks or make her apprehensive of danger of the appliance.

11. Don't let your men accept gifts or gratuities from customers. Such acceptances breed obligation which leads invariably to embarrassing situations.

12. Tell your men not to discuss unrelated subjects with the customers.

13. Train your men to make no statements that will reflect upon your company, your fellow employees or your equipment.

14. Be certain your men are always neat appearing.

15. Be sure the serviceman does not enter the house chewing tobacco, smoking a pipe or cigarettes, or wearing hob nailed shoes.

16. Be careful to instruct him to be careful about where his tools are laid or placed in the customer's house and not to drop them. Insist that your men clean up the kitchen after the job is completed.

17. Before he leaves, the serviceman should explain to the customer what was done so that she is satisfied that her request for service has been completel handled.

18. If serviceman must come back be sure he makes an appointment.

19. Be sure he keeps that appointment.

20. If possible, he should phone first even though he may have an appointment. Maybe the customer forgot. It is the customer's privilege to forget, not yours.

21. He should not cross lawns.

22. He should use walks leading up to the door.

23. He should knock or ring gently.

24. Before leaving he should ask the customer to remind her friends of your service.

25. He should get your repair order signed by the customer indicating that the customer is completely satisfied.

26. You should encourage service work on a C. O. D. basis in every case where there might be the slightest question—in all cases if possible.

27. When service requests come in, ascertain if the customer desires to pay the service man. Don't ask if they want you to bill them. That is negative selling and might prompt them to say, "Yes, send me a bill."

28. Train and work hard with your service personnel, teaching them good service habits, selling habits, and good customer relations and careful workmanship.

29. Don't permit service men to chew up fittings with pliers or wrenches. Teach them to use the correct tools for the various parts that are to be repaired.

30. Good tools means good service work. Poor tools produce poor work. If work is poor, you cannot hope to expect new customers. Be careful of the property you are repairing even though it may be old.

31. If you are not positive about making a repair and do not know exactly how to do it, find out.

32. Write your various suppliers for repair information. They will be happy to assist and advise you. Take advantage of the services that various manufacturers have to offer.

33. When a repair bill is paid for services rendered, send a thank-you card. Make it as personal as you can. The card costs only a penny.

34. Use direct mail campaigns for soliciting service.

35. Make major repair estimates free.

36. If the service work is of a major nature, take the appliance to your shop and give your customer something to use while the appliance is in for repair.

37. Be complimentary to your customers in every instance. While you may not have appliances to sell for replacements, the service impression you leave will pay dividends later and help your sales impression.

38. Be careful that service men don't go on a job with insufficient tools or improper equipment.

39. When a request for service comes in over the phone, get as much information as you can from the customer with reference to the name of the appliance, the type of the appliance, the serial number, or catalog number of the appliance. Save yourself time, money, effort and extra trips by getting as much of the information as you can over the phone.

40. During the service call the service man should explain any new ecnomies that might affect the use and operation of the appliance repaired in the customer's home.

41. If your local utility is in the process of setting up an appliance

TO HIT 'EM H-A-R-D-E-R

THE year 1943 promises to be the grimmest, hardest year this country has ever faced. Every effort, and every dollar of national income not absolutely needed for existence, should go into war work and War Bonds.

In the Pay Roll Savings Plan, America finds a potent weapon for the winning of the war—and one of the soundest guarantees of the preservation of the American way of life!

Today about 30,000,000 wage earners, in 175,000 plants, are buying War Bonds at the rate of nearly half a billion dollars a month. *Great as this sum is, it is not enough!* For the more dollars made available now, the fewer the lives laid down on the bloody roads to Berlin and Tokio!

You've undoubtedly got a Pay Roll Savings Plan in your own plant. But how long is it since you last checked up on its progress? *If it now shows only about 10% of the gross payroll going into War Bonds, it needs jacking up!*

This is a *continuing* effort—and it needs *continual* attention and *continual* stimulation to get fullest results.

You can well afford to give this matter your close personal attention! The actual case histories of thousands of plants prove that the successful working out of a Pay Roll Savings Plan gives labor and management a common interest that almost inevitably results in better mutual understanding and better labor relations.

Minor misunderstandings and wage disputes become fewer. Production usually increases, and company spirit soars. And it goes without saying that workers with substantial savings are usually far more satisfied and more dependable.

And one thing more, these War Bonds are not only going to help win the war, they are also going to do much to close the dangerous inflationary gap, and help prevent post-war depression. The time and effort *you* now put in in selling War Bonds and teaching your workers to save, rather than to spend, will be richly repaid many times over—now and when the war is won.

★ ★ ★

You've done your bit — Now do your best!

repair training school, have all of our men attend their classes. Seek their guidance and advice when needed.

42. Keep our repair shop well organized and fully equipped to do good repair work.

43. Keep our store appearance up. Your customer is impressed by the quality of our service, by the way you keep house. Slovenly housekeeping generally means slovenly service. Keep your store room and parts stock in good order.

44. Sell the neighborhood service idea and remember that you are in the business of "Fixing 'Em Up and Making 'Em Work."

45. Identify your business as being an authorized gas appliance service agency.

46. Use the "before and after" idea in window displays to sell your repair service.

47. Before attempting repair, carefully diagnose nature of complaint according to prearranged method.

48. If you have a home service department, follow through with it.

49. Suggest to your customer that she stop in and get up-to-date information on nutrition to help in further economizing.

50. Train your female help to become conversant on problems pertaining to food.

51. Urge all employees to take courses in nutrition offered locally through Red Cross, civilian defense councils, gas companies and other agencies.

WPB Forms Industry Advisory Committee

The director of industry advisory committees of the War Production Board on May 17 announced the formation of a natural gas industry advisory committee. Edward Falck will sit as government presiding officer of the new group. Committee members are:

B. C. Adams, president, The Gas Service Co., Kansas City, Mo.

Thomas H. Allen, president, Memphis Light, Gas & Water Division, Memphis, Tenn.

F. M. Banks, vice president, Southern California Gas Co., Los Angeles.

John W. Batten, vice president, Michigan Consolidated Gas Co., Detroit.

B. R. Bay, president, Northern Natural Gas Co., Omaha, Neb.

Walter C. Beckjord, vice president, Columbia Gas & Electric Corp., New York City.

Paul Kayser, president, El Paso Natural Gas Co., El Paso, Texas.

E. V. Kesinger, vice president, Natural Gas Pipeline Co. of America, Chicago.

W. G. Maguire, chairman of the board. Panhandle Eastern Pipe Line Co., Kansas City, Mo.

N. C. McGowen, president, United Gas Pipe Line Co., Shreveport, La.

James B. Black, president, Pacific Gas & Electric Co., San Francisco, Calif.

Joseph Bowes, president, Oklahoma Natural Gas Co., Tulsa.

J. A. Brown, director, The Commonwealth & Southern Corp., New York City.

Frank L. Griffith, vice president, The Peoples Gas Light & Coke Co., Chicago.

D. P. Hartson, vice president, Equitable Gas Co., Pittsburgh, Pa.

E. C. Joullian, president, Consolidated Gas Utliities Corp., Oklahoma City, Okla.

J. French Robinson, president, The East Ohio Gas Co., Cleveland.

E. F. Schmidt, vice president, Lone Star Gas Co., Dallas, Texas.

H. Carl Wolf, president, Atlanta Gas Light Co., Atlanta, Ga.

Harry K. Wrench, president, Minneapolis Gas Light Co., Minneapolis, Minn.

C. P. Rather, president, Southern Natural Gas Co.

School and Gas Officials Discuss Conservation

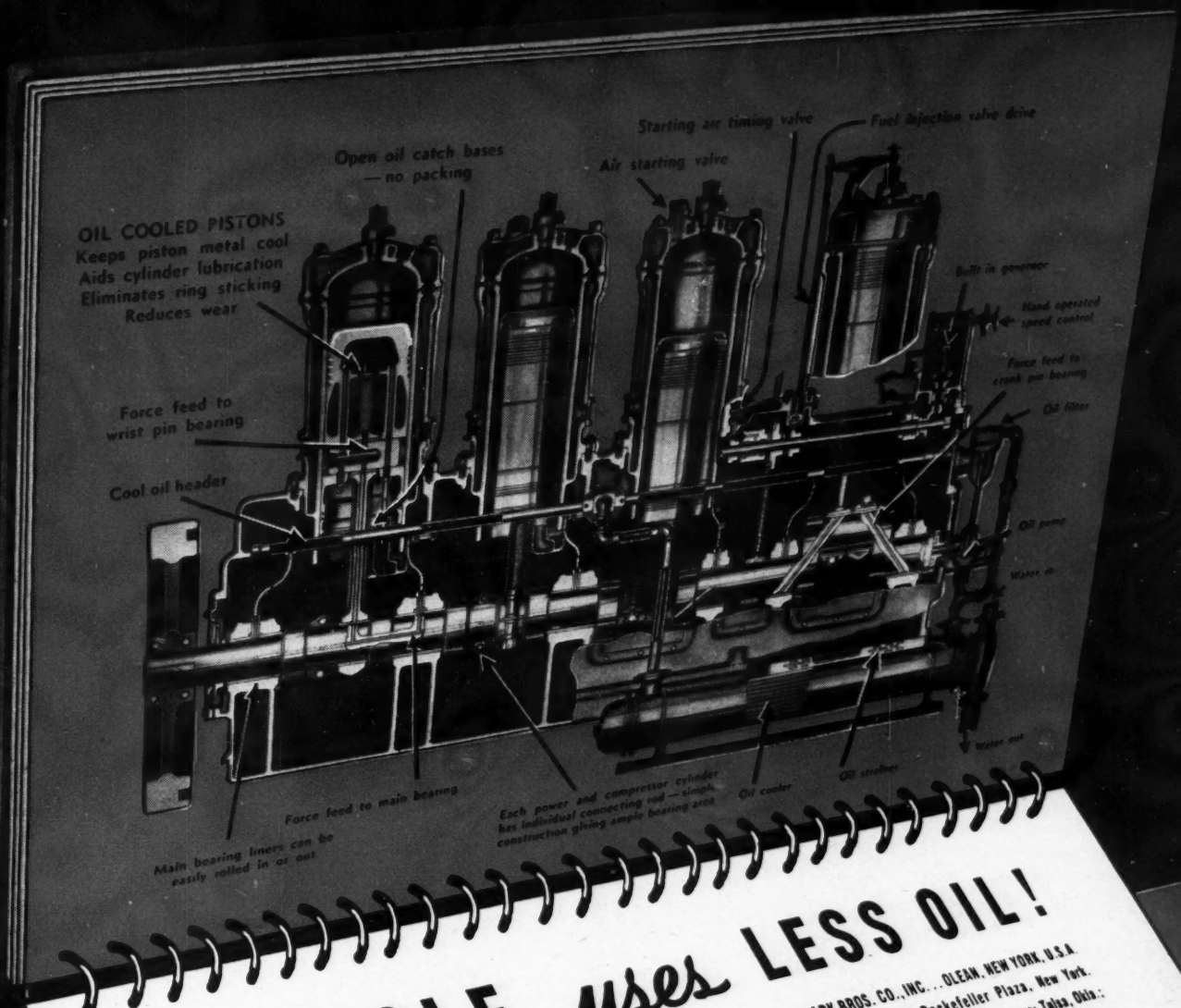
FOR the purpose of promoting further conservation of fuel and food, officials of Southern California Gas Co. and Southern Counties Gas Co. met with the cafeteria managers of the Los Angeles city schools on May 17 and 18. The size of the group necessitated the holding of two similar meetings on consecutive days.

Brief talks were given by gas company officials and by Vierling Kersey, superintendent of schools. Special guest at both meetings was Jessie McQueen, national home service director, American Gas Association, who contributed many helpful suggestions on conservation. Frank Weiss was master of ceremonies on both days.

Demonstrations on the proper way to use heavy-duty equipment, to prolong the longevity and to conserve fuel and food were conducted by Cecil Hovelsrud. Feature of the meetings was a contest, the purpose of which was to have the audience guess the cost of fuel used in making a certain product. For the contest a meter was installed on one of the ranges used in the demonstration, and when the product was removed the meter was read and the cost computed. A $25 war bond was awarded the winner.

Officials of the two Los Angeles gas companies also met with 150 home economics teachers of the city schools for a demonstration of dehydration processes on May 26.

Pictured at a dinner and demonstration for cafeteria managers of Los Angeles city schools: **A. F. Bridge,** president, American Gas Association; **Jessie McQueen,** home service counsellor, AGA; **F. S. Wade,** president, Southern California and Southern Counties Gas Co.'s; **Frank Weiss,** assistant to vice president, Southern California Gas Co.; **Iris H. Albert,** superintendent, home economics, Los Angeles schools; **W. M. Jacobs,** general superintendent of sales, Southern California Gas Co.; **Katherine S. Rathbone,** home service director, Southern Counties Gas Co.; **D. C. Myers,** special representative, sales department, Southern California Gas Co.; **C. H. Potter,** general commercial manager, Southern Counties Gas Co.; **Mercedes Bates,** home service supervisor, Southern California Gas Co.; and **R. D. MacMahon,** commercial sales supervisor, Southern California Gas Co.

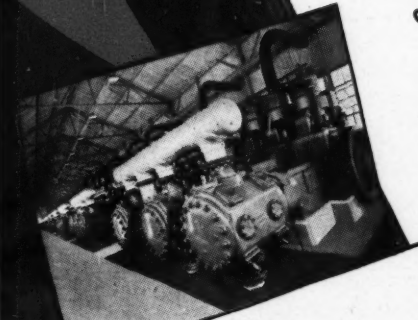

OIL COOLED PISTONS
Keeps piston metal cool
Aids cylinder lubrication
Eliminates ring sticking
Reduces wear
Open oil catch bases — no packing
Starting air timing valve
Fuel injection valve drive
Air starting valve
Built in governor
Hand operated speed control
Force feed to crank pin bearing
Oil filter
Force feed to wrist pin bearing
Cool oil header
Oil pump
Water in
Water out
Oil strainer
Oil cooler
Force feed to main bearing
Each power and compressor cylinder has individual connecting rod — simple construction giving ample bearing area
Main bearing liners can be easily rolled in or out

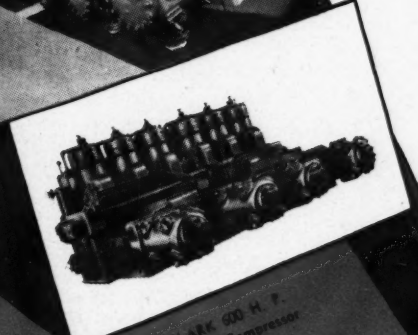
2-CYCLE *uses* LESS OIL!

Plant records prove that the 2-cycle engine uses far less lubricating oil than the 4-cycle. Not only does it eliminate the extra "charging" stroke of the piston (which must be lubricated)—but in the 2-cycle engine, leakage past piston rings goes out the exhaust port, instead of entering the crankcase to dilute and foul the lubricating oil.

Many Clark "Angles" operate without changing the crankcase oil for over a year due to freedom of the oil from any tendency to "varnish". Check with Clark users . . . . . they will advise that bearing troubles practically cease.

The CLARK 2-cycle also offers greater fuel economy, less wear smoother operation, fewer man hours, simpler construction, lower installation cost. Investigate.

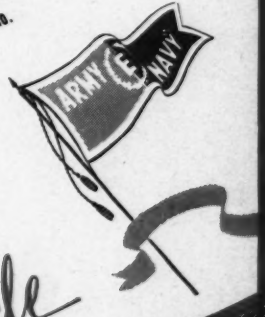




CLARK 900 H. P. "Angle" Compressor

CLARK BROS. CO., INC. . . OLEAN, NEW YORK, U.S.A.
Export Office: 30 Rockefeller Plaza, New York.
Domestic Sales Offices and Warehouses: Tulsa, Okla.; Houston, Tex.; Chicago, Ill. (122 S. Michigan Av.); Boston, Mass. (131 Clarendon St.); Huntington Park, Calif. (5715 Bicket St.) Foreign Offices: 72 Turnmill St., E. C. 1, London; Avda Roque Saenz Pena 832, Buenos Aires.

AFFILIATED COMPANIES: Dresser Mfg. Co., Bradford, Pa.; Pacific Pump Works, Huntington Park, Calif.; Bryant Heater Company, Cleveland, Ohio.



CLARK
Super-2-Cycle

Indoor Climate Institute Has National Educational Task

PLANS for the formation of an industry-wide cooperative educational program known as the "Indoor Climate Institute" which will acquaint the American public with the best equipment and methods for producing indoor comfort in the postwar homes of tomorrow have been announced by Paul B. Zimmerman, vice president, Airtemp Division, Chrysler Corp. The Indoor Climate Institute program, which has been under consideration by a steering committee (see cut) representing all divisions of the heating industry for several months, will be presented to other leading trade associations at the earliest meetings of these groups.

The Indoor Climate Institute program will be educational and promotional in nature and will not supersede any of the operating functions of the various trade associations in the heating and air conditioning industry.

When the final organization of the Indoor Climate Institute is perfected as a non-profit corporation, it will be governed by a group made up of individuals representing trade associations in the fields of boilers, controls, warm air heating, oil burning units, gas equipment, stokers, steel boilers and auxiliary equipment. Additional representatives at large will serve on the board.

The Indoor Climate Institute will be supported by subscriptions from manufacturers of heating units and auxiliary equipment in the heating and air conditioning industry.

Promotional and educational plans formulated in the headquarters' office will be carried to local organizations in the key cities of the country. It is expected that the local groups will be supported by fuel interests, utilities, dealers, contractors, jobbers, manufacturers' agents, and others interested in the welfare of the heating industry.

In answering the question, "Why a national cooperative program?" Mr. Zimmerman stated that the public is somewhat confused by the many general claims made for all types of heating and air conditioning equipment, and it has not yet been sold on good heating and air conditioning as a sound value.

By combining its educational and promotional efforts, the industry as a unit can give the public one single strong story without the usual conflict of individual advertising. This story will be of news interest and will be well supported by the press because it will permit the publishers to promote this great new development without being partial to any one interest.

In presenting an outline of the Indoor Climate Institute program, Mr. Zimmerman called attention to the success of several other national educational programs. For example, household refrigeration was not "sold" to the public until the industry finally banded together in 1926 to form the Food Preservation Council. Adopting the slogan, "Below Fifty Degrees Lies Safety," the group obtained the help of national magazines, the trade press, schools, utilities and other institutions in teaching the American housewife the importance of food preservation. Attaining a phenomenal success, sales rose from less than 300,000 refrigerators in 1926 to over 3,000,000 in 1940. Sales of ice refrigerators were also greatly improved during this period.

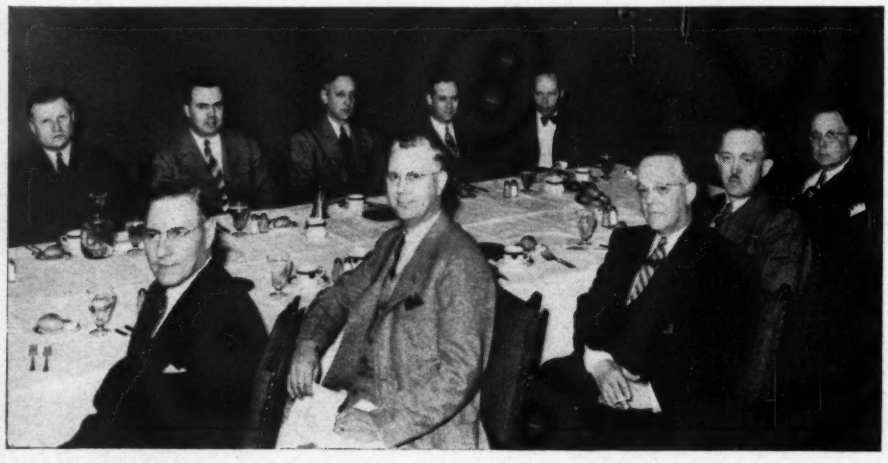
Identification Seals: The Indoor Climate Institute (I. C. I.) contemplates the issuance of identification seals; the national organization to present them to manufacturers of automatic heating and air conditioning equipment meeting I. C. I. standards; the local organizations to present them to installing dealers and contractors handling work in accordance with the best established local practice. It is expected that equipment standards will be established by the various associations now doing research work on problems of this kind and that installation standards will be set acording to the best local practice, to meet all safety codes and ordinances.

Consulting Service: Local bureaus established under the national Indoor Climate Institute program will provide a consulting service for home owners, dealers, contractors, architects, engineers and builders. The local bureau will check plans to see that the heating system is to be installed according to the best known practice and advise people interested as to necessary changes.

Local Meetings: Meetings will be held in all principal cities to acquaint the local trade and building interests with the I. C. I. program. These meetings will be conducted by field specialists employed by the national organization and will serve to raise the standards of the entire heating industry.

Educational Work: To interest a higher type of personnel in heating work in the post-war era, the Indoor Climate Institute will cooperate with the national associations in the issuance of manuals and training courses used in the industry. The educational director of I. C. I. will also seek to establish training courses at colleges, universities, night schools, Y. M. C. A. schools, and with other educational institutions. It is expected that the splendid work now being done at the University of Illinois and at Michigan State College can be expanded to many other educational institutions.

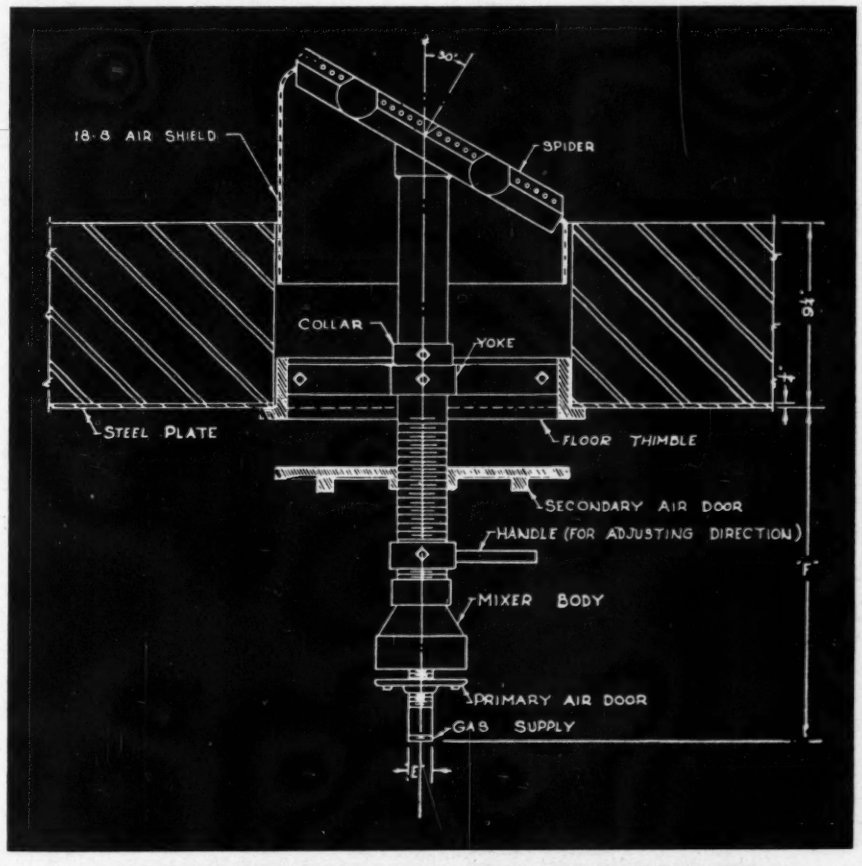
Publicity: The national I. C. I. office will issue publicity that can be used in national magazines, newspapers, and by the business press. Local organizations will also serve as centers for issuing publicity that will be of interest to the local press. All campaigns will be carefully prepared to give the people complete information about improvements that have been made in indoor comfort.



Organization activities of the Indoor Climate Institute are being directed by members of the Steering Committee shown above. Front row, left to right: P. B. Zimmerman, Airtemp Division, Chrysler Corp., chairman; C. T. Burg, Iron Fireman Mfg. Co.; W. J. Grover, Surface Combustion Corp.; J. M. McClintock, Illinois Iron & Bolt Co.; A. T. Atwell, Quaker Mfg. Corp. Back row, left to right: C. E. Lewis, Delco Appliance Corp.; L. N. Hunter, National Radiator Co.; C. D. Lyford, Minneapolis-Honeywell; J. R. Scott, Mueller Furnace Corp.; and W. H. Knowlton, secretary.

BURNERS

John Zink manufactures more than FIFTY TYPES of burners for domestic boilers, heating boilers, industrial boilers and power boilers. The designs are protected by TWENTY United States Letters of Patent.



LATEST DEVELOPMENT IN JOHN ZINK BURNERS

BI-MIX DIRECTIONAL HEAT BURNER

- This startling development in burner design places the heat where you want it—when you want it.
- The burner is so adjustable that the operator can turn the burner to place the heat where desired.
- Will be furnished as a gas burner only or as a combination oil and gas burner.

Write for Specifications

JOHN ZINK COMPANY

Tulsa, Oklahoma

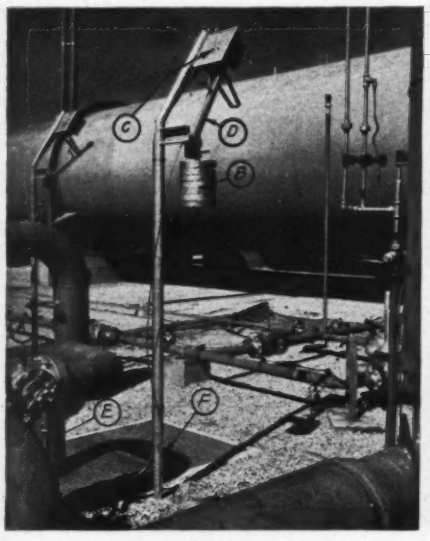
NEW YORK • LOS ANGELES • DETROIT • SAN FRANCISCO

NU-WAYS

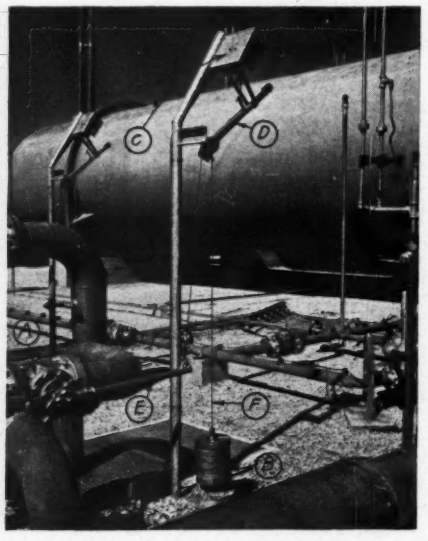
Valve Closing Safety Device

JAMES LEONARD, engineer, formerly with Southern Counties Gas Co., Los Angeles. Reprinted from "The Flow Line," published by Merco Nordstrom Valve Co. and Pittsburgh Equitable Meter Co.

TREND of today's plant designing is toward automatic or semi-automatic equipment to maintain a uniform operation. In designing this kind of operating equipment, it is necessary many times to "bend over backward" in providing safety devices to insure safe plant operation.



View No. 1
Valve in operating position.



View No. 2
Valve is closed after weight drops.

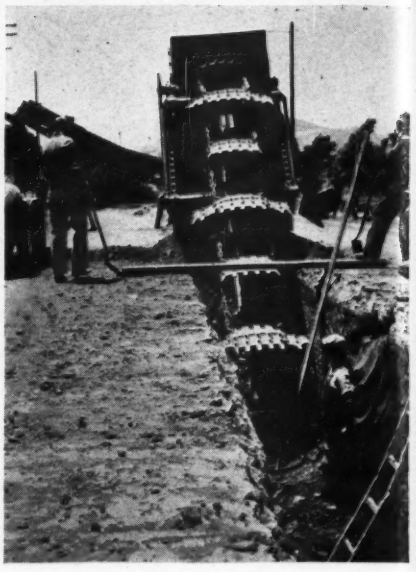
One unique safety device now being used by the Southern Counties Gas Co. of California is an electrically energized magnetic contactor to operate a plug valve closing unit.

In photo No. 1 the valve is shown in operating position. The gas is flowing through valve "A" and the extended valve handle "E" is in a vertical position. The cable "F" is now slack, and at one end it is attached to the extended valve handle "E" and at the other end it is attached to the weights "B." Weights "B" are hung on the weight arm "D." At the top of the weight arm "D" is attached the armature of an electrical magnet. The magnet itself is mounted in the housing "C."

As long as the electric current flows through the magnet, the weight arm is held in place. When the supply current is interrupted, the magnet is de-energized, and the weight arm "D" rotates about 15°. This releases the weights "B," which have a free fall of about three and one-half feet, as can be seen in photo No. 2. The cable "F" is drawn tight, and the extended valve handle "E" is raised to a horizontal position. In this position the valve "A" is fully closed and the flow of gas is stopped.

The valve remains closed until the station operator has corrected the condition causing the supply current failure. The plant is so arranged that the supply current failure can be caused by compressor motors becoming overheated, improper gas mixture, a direct break in the plant piping, or a short circuit break in the protective network of the electrical system.

When the plant is ready for operation again, the operator opens valve "A" and lifts the weights "B" on the hook of weight arm "D." The plant is then in operation.



Extensions Enable Trencher To Cut Wider Ditch

The illustration shows a Model 120 Buckeye trencher which has been equipped with special rigging, enabling it to dig a trench 60 in. wide by 7½ ft. deep. Normal design of the trencher permits it to dig a 30-in. wide trench with 11½ ft. depth.

The extended digging width was obtained by fastening extensions on alternate buckets. The black arrow points to one of the attached extensions. The particular job illustrated was contracted by Pacific Pipe Line Construction Co. and involved the laying of a gas pipeline in red rock formation near San Francisco.

■ ■

Engine Air Filter, Humidifier

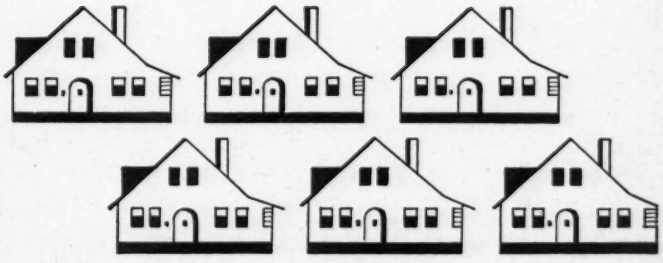
D. B. Young, Superintendent, J. E. Crosbie, Inc., Fittstown, Okla. Submitted in Operating Kinks Contest, Natural Gasoline Association of America, Tulsa, Okla.

Air filtering has become a matter of growing importance in areas where dust storms have been increasing in recent years. In making this filter care has been taken to use a box that is large enough to handle the air required by the engine. This box has two compartments: one is the absorbing or filtering chamber which is packed loosely with shavings, over which water pours; the other serves as a scrubber or settling chamber.

While a water filter is not as efficient as an oil filter, one constructed in this way has advantages in a gasoline plant because of its low cost, and because of the humidifying effect produced. It is easily constructed at the plant. Water can be supplied by the engine jacket water system. It has been found that the greatest benefit from this equipment is derived through increasing the

HOW ELECTRIC POWER HELPS BUILD SHIPS

J. A. Krug, director of the WPB Office of War Utilities, says: "I do not know of a single instance in which the operation of a war plant has been delayed by the lack of electric power supply....There is today no shortage of power."



Each Shipyard Worker uses ELECTRICITY *equal to the service needs of* SIX *average six-room homes*

IN CALIFORNIA'S record-breaking shipyards the manpower production of skilled hands is multiplied manifold by the extensive use of electricity.

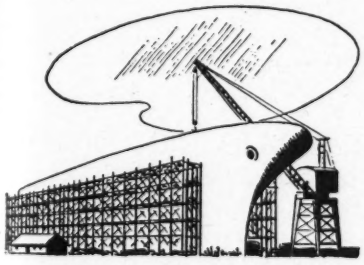
Electric energy in the hands of each shipyard worker is sufficient to provide complete electric service for six average six room homes. It is equal to the strength of 2½ horses working steadily eight hours.

Other war industries are also requiring more and more power service. Electric power demands have reached new peaks.

To meet the 1942 peak power demand, more than 300,000 horsepower of generating capacity was added to our interconnected system.

To speed war work in 1943, additional power plants now being rushed to completion will add another 300,000 horsepower of capacity during this year and that also will be fully employed in the all-out war effort.

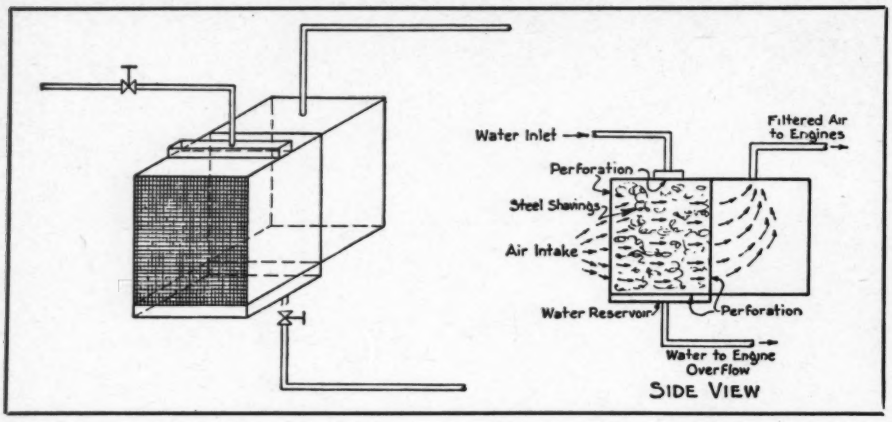
To keep California "power-full in production" and to meet the new demands of an all-out fighting war is the determination of this company's 12,000 employees. It is their pledge to the more than 2100 P. G. and E. men and women in the armed forces in all parts of the world.



P·G·and E·

PACIFIC GAS AND ELECTRIC COMPANY

BUY MORE WAR BONDS

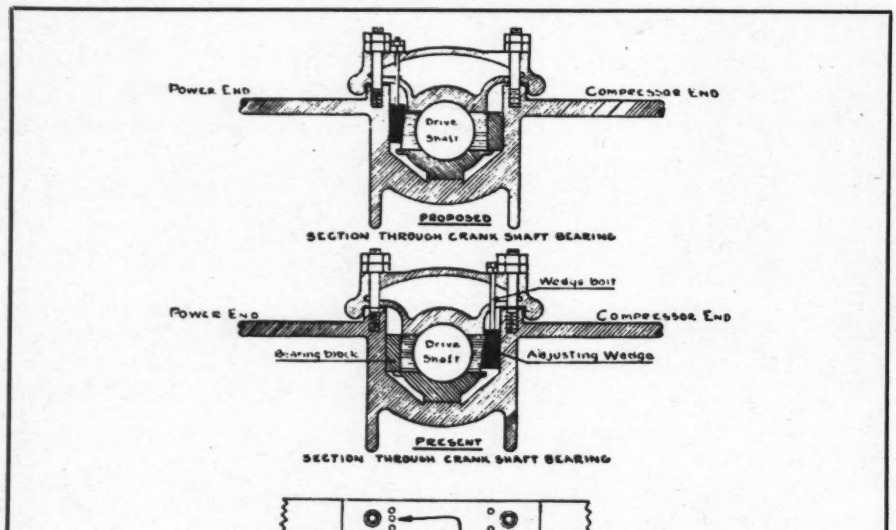


horsepower of the engine as a result of increasing the humidity. The same results are obtained as when water injection is used, except that none of the operating problems are encountered which come with water injection.

Gas Engine Speed Indicator

C. C. Gibson, Gas Tester, and M. C. Blair, Boiler Foreman, Phillips Petroleum Co., Oklahoma City, Okla. Submitted in Operating Kinks Contest, Natural Gasoline Association of America, Tulsa, Okla.

To provide for easier and better adjustment of bearings and better alignment of crankshaft, and less cracking of babbitt, an improvement has been made in Clark main bearings. It had been found that with bearings of this kind, in their usual form, the lock nuts on the wedge bolts sometimes work loose. When the wedge bearing is loose the power thrust against this loose bearing will crack the babbitt.



The accompanying drawings show the present bearing and the proposed change. To effect the change, move the present straight side bearing from the power end side to the compressor end side; change the wedge quarter bearing on the compressor end to the power end side, reversing it so that it will be top side down, in relation to its original position. The wedge block is, likewise, top side down. Three adjusting screws are used: one to pull the wedge up for loosening; two for pushing the wedge down for tightening. The cost of this change is very small. Assurance is given of easier fitting bearings, less adjustment trouble after the bearings are in operation.

Form for Straightening Tin Meter Fronts or Backs

D. E. Farmer, superintendent of utilization, Portland Gas & Coke Co., Portland, Oregon

Tinned case meter fronts or backs which have been dented or caved in may be restored to usable condition by means of an inexpensive form made of cement. A new front or back meter section is placed in a box of freshly made Portland cement. When the cement hardens, removal of the meter part leaves a form into which a damaged front or back may be placed and hammered out with a hard rubber mallet. After some experimenting, quite acceptable fronts or backs may be salvaged from damaged parts which might otherwise have been discarded.

■ ■

Promulgation of Gas-Oil Ratio Order Recommended

A MEETING of the Lea County, N. M., engineers and operators committee, held at Santa Fe, N. M., April 25 and 26, recommended to the Oil Conservation Commission of that state the promulgation of a permanent gas-oil ratio order for the various fields located in Lea County. The meeting also asked for an order to permit transfer of allowables from high gas-oil ratio to low gas-oil ratio wells in certain Lea County fields for limited periods.

The meeting recommended that exceptions be made as applying to the Hardy, Penrose, Skelly, Mattix, Langlie, Rhodes, Lynn, Cooper, and Jal fields. These are nearly depleted and adequate reservoir energy exists to produce the remaining recoverable oil without sub-surface waste.

It was recommended that all gas-oil ratio tests be taken under supervision of the New Mexico Oil Conservation Commission.

"Data considered at the meeting revealed that the operators and engineers committees had compiled much interesting information about the performance of New Mexico fields. Great accomplishments in oil and gas conservation in New Mexico already completed is due in part to the splendid cooperation between the operators and the New Mexico Oil Conservation Commission," said E. G. Dahlgren, technical secretary of the Interstate Oil Compact Commission.

■ ■

Cabot Gas Case Reopened As Intervention Permitted

The Federal Power Commission announced May 20 its orders permitting the intervention of seven upper New York State communities in the hearing which opened May 19 in Rochester, N. Y., on (1) an application by the Cabot Gas Corp. for permission to abandon the service of natural gas from its 14-in. pipeline to its customers in the State of New York and to abandon the transportation of natural gas for ultimate redelivery to Godfrey L. Cabot, Inc., its parent company; and (2) an application by Godfrey L. Cabot, Inc., for permission to cease supplying natural gas to Cabot Gas Corp. to Producers Gas Co. at points in Angelica and Belmont, Allegany County, New York, and to certain customers of Empire Gas Fuel Co., also in Allegany County. An earlier order of the commission permitted the Pavilion Natural Gas Co. to become an intervener in the proceedings. The May 20 orders permit the intervention, pursuant to petitions filed by each, of the following communities: The towns of Hume and Perry and the villages of Le Roy, Leicester, Geneseo, Perry and Warsaw, all in New York.

■ ■

"Cookin' With Gas" Title of New Song

The expression, "Cookin' With Gas," which has almost become part of the American language, has now been set to music by a member of the gas industry. Russ Pence, Columbia City manager, Northern Indiana Public Service Co., has written the musical score for this new song. The tune is bright and lilting and catchy words make it good material for quartet renditions.

Copies may be obtained by writing to the Bell Music Co., 20 E. Jackson Blvd., Chicago.

Service to Industry

If you are building or converting combustion facilities for power, heating or processing — Webster, standard, designed and manufactured gas burners, oil burners, combination burners and control units are available.

Webster Combustion Engineers are ready to assist in solving your combustion problems and to design special equipment to meet special conditions.

Consult Webster First —

THE WEBSTER ENGINEERING COMPANY . . . . TULSA, OKLA.

Division of **SURFACE COMBUSTION** - - - - - - - - - - - - - - - - **Toledo, Ohio**

Representatives— **CATLETT ENGINEERS, INC., Dallas ● F. J. EVANS ENGINEERING CO., Birmingham, Houston**
F. P. FISCHER ENGINEERING CO., New Orleans ● E. G. LANGHAMMER CO., San Antonio
SURFACE COMBUSTION, Chicago, Denver, Pittsburgh ● OIL FIELD EQUIPMENT CO., New York

ABSTRACTS

Books and Reports

The Selection of Anthracite for Water-Gas Operations—L. L. Newman, assistant professor, Fuel Technology, Pennsylvania State College, State College, Pa. As a result of the present war demand for metallurgical coke, it is becoming increasingly difficult for water-gas plant operators to obtain their coke requirements at a reasonable price. Many of them even lack the assurance that they can have a dependable supply at any price, and they are further confronted with a growing oil shortage which may force them to increase the ratio of solid to liquid fuel consumed, thus aggravating the coke situation.

There are but few operators who have had previous experience with anthracite whose water-gas plants have not been modernized to the extent of installing backrun equipment, heavy-oil processes and blowers of much larger capacities. Under the old operating conditions, with low blast pressures and without the strain on the fuel bed resulting from the spraying of oil on top of it, almost any anthracite was suitable. Even then an occasional shipment of coal gave trouble, the reason for which was not always known. The resumption of the use of anthracite in place of coke could mean a repetition of the change-over difficulties which were experienced when the trend was in the opposite direction unless consideration is given to the selection of the coal. It is the purpose of this paper to call attention to the importance of selecting the correct grades of coal for any particular type of operation and to present in tabular form "Information from Practical Operation of Water-Gas Generators with Anthracite." Some readjustments in method of operation will inevitably be required, but it is hoped that the specific information showing the methods which have proved satisfactory elsewhere will be of assistance in avoiding some of the stumbling blocks which might otherwise be encountered.

Determination of Types of Sulfur Compounds in Petroleum Distillates — John S. Ball. Contains a method for the determination of types of sulfur compounds in petroleum distillates. Work done under a cooperative agreement of the Bureau of Mines, Department of the Interior, and the University of Wyoming. Describes analytical methods for petroleum distillates for hydrogen sulfide, mercaptans, free sulfur, disulfides, aliphatic sulfides, and aromatic sulfides and thiophenes. The report includes discussions of advantages and disadvantages. It may be obtained upon request from the Information Division, Bureau of Mines, Washington, D. C. Hotel Bradford, Boston, Mass., January 14, 1942.

Specific Volumes and Phase-Boundary Properties of Separator-Gas and Liquid-Hydrocarbon Mixtures — Kenneth Eilerts, and R. Vincent Smith. (U. S. Department of Interior, Bureau of Mines, A. G. A. report—R. I. 3642.) Samples of liquid and gas from the separator at a combination well taken under conditions of steady-flow were recombined in the laboratory in the proportions of the measured producing gas: liquid ratio and in other proportions to provide mixtures on which physical properties could be determined at the pressures and temperatures involved in production. Specific volumes as a function of pressures up to 5,000 per sq. in. abs. and temperatures ranging from 70° to 280° F. were measured on 10 mixtures of the separator gas and liquid samples. Particular attention was given to determination of the phase state of the mixtures. Distillation analyses were made to determine the composition of the natural hydrocarbon mixtures upon a component basis. Experimental data obtained provided information for evaluating phase-boundary properties of the mixtures in terms of pressure, temperature, and composition. Information obtained in the investigation provides data for use in engineering calculations and for planning further experimentation designed to increase knowledge concerning the behavior of natural hydrocarbon systems when subjected to production and refining processes.

A Factual Report of Progress With Direct Radiant Kiln Firing With Gas in Various Branches of the Ceramic Industries—Harry W. Smith, Jr., and Joseph A. Ehlinger, Kiln and Furnace Division, The Selas Co., Philadelphia. The objective of this report is to summarize the ceramic industry's experience to date with a fundamentally new technique of kiln firing, to wit. the combustion of gaseous fuels "catalytically" on the concave surfaces of a multiplicity of incandescent ceramic cups distributed in pattern over the kiln walls without muffles, baffles or firetubes between burning gases and ware. This new technique has been appropriately called "direct radiant gas firing." Its use in the full-scale manufacture of ceramic products dates from the initial run through the now famous circular bisque kiln at Lenox, Inc., in Nov., 1940, and its possibilities (beyond the four or five classes of production to which it has thus far been applied) are so enticing that a factual digest of current knowledge is in order.

Cathodic Protection Installation on Bare Pipe—Harry J. Keeling, Southern Counties Gas, Los Angeles, Calif. This paper describes the results of a 3½ year test involving the cathodic protection of 3500 feet of bare 12-inch steel pipe, using a single six-ampere rectifier at one end. The drainage current was held constant throughout the test. It was found that the potential of the pipe with respect to soil decreased rapidly during the first three months of operation, and this potential underwent a seasonal variation which corresponded roughly to the soil moisture content. Test coupons indicate that the pipe line received adequate protection during the first eighteen months, but much less effective protection during the last eighteen months. It is planned to increase the drainage by installing an additional rectifier at the opposite end of the test section and continue with the test.

The Cleaning of Pipe Corrosion Coupons—A. C. Alter and C. E. Lee, Southern California Gas Co., Los Angeles, Calif. Clean pipe-line corrosion coupons and coupons cut from recently excavated, corroded pipe were cleaned by a chemical method using an ammonium citrate solution and by cathodic cleaning methods using a sulfuric acid solution or a sodium carbonate-sodium hydroxide solution as electrolytes.

The results in terms of loss of parent metal from clean coupons, efficiency of removal of corrosion products from corroded coupons, and time to clean corroded coupons are used to evaluate the cleaning methods.

An appreciable loss of parent metal occurs when the chemical method using an ammonium citrate solution is used; the amount depending on the solution concentration and cleaning time. A current density of about 0.1 ampere per square inch is sufficient to cathodically protect the coupons, i.e., result in no significant change in amount of parent metal, in either the sulfuric acid or the sodium carbonate-sodium hydroxide solutions regardless of the concentration and cleaning time within the ranges studied.

These cleaning methods appear to be about equally effective in the complete removal of corrosion products. The ammonium citrate method requires the least cleaning time and the sodium carbonate-sodium hydroxide the most cleaning time.

Cost of Cathodic Protection—S. A. Wright, Pacific Gas and Electric Co., San Francisco, Calif. This paper is a discussion of operating costs and data on eight electrical pipe protection units of the Rexselen type, which have been in operation for over five years. These units protect a high pressure transmission main that traverses a route through varying topography and wide range of soil conditions. It is hoped that the discussion and data presented will be of value to companies and engineers that may be contemplating the application of electrical protection to portions of their pipe line systems.

Technical Research by the Bureau of Mines in Oil and Gas Production, Refining and Utilization—H. C. Miller and G. B. Shea.

Gas Chemists' Book of Standards for Light Oils and Light Oil Products—V. J. Altieri (published by the American Gas Association, Inc., 420 Lexington Ave., New York City). The purpose of this book is to explain simply and accurately the details of current specifications, definitions, tests, and facilities already established in matters relating to light oil and light oil products. The objective is to furnish information that will help to speed up production, avoid unnecessary changes in equipment, reduce non-essential demand for strategic or critical materials, facilitate the formulation of new standards, and thus aid the war effort.

■ ■

Hearing Set on Application For 30-Mile Kansas Pipeline

A plan for the construction and operation of approximately 30 miles of natural gas pipeline and appurtenant facilities extending between the Kansas-Nebraska Natural Gas Co.'s existing compressor stations in Kansas has been filed with the Federal Power Commission for approval. A hearing has been set for 9:45 a. m., June 22, in the FPC's hearing room, Hurley-Wright Bldg., 1800 Pennsylvania Ave., N. W., Washington, D. C.

The order provides that interested state commissions may participate in the hearing.

ASSOCIATIONS

AGA Holds Production, Chemical Meeting

A VARIETY of papers covering the production and chemical aspects of the gas industry were presented when some 350 engineers and chemists gathered at the Hotel Pennsylvania, New York, on May 24 and 25 for the American Gas Association's Joint Production and Chemical Committee Conference. E. W. Zimmerman, chairman of the gas production committee, presided at the Monday morning session.

Major Alexander Forward, managing director of the American Gas Association, in referring to post-war planning outlined the suggestions put forward by British technical leaders and reported in April by the *Gas Times* of London.

E. R. Acker reported on recent research developments undertaken by the AGA committee on war activities, of which he is chairman.

D. S. Reynolds, Boston Consolidated Gas Co., presented a paper on the "Two Shell Water Gas Sets in Boston," excerpts from which appear elsewhere in this issue. Another speaker at the May 24 meeting was Louis Shnidman, Rochester Gas & Electric Corp., who spoke on "An Approved Apparatus for the Rapid Determination of Traces of Carbon Monoxide."

"Gum Protective Devices for Gas Appliances" was the title of Dr. F. E. Vandaveer's paper, and it appears in full on page 28 of this issue.

Three round-table luncheon conferences on the subjects: water gas operations, chemistry in the gas industry, and coal carbonization were presided over by P. T. Dashiell, Philadelphia Gas Works Co.; Dr. F. H. Dotterweich, Texas College of Arts and Industries; and A. C. Sedlachek, Philadelphia Coke Co., respectively.

T. L. Robey, chairman, chemical committee, presided at the Tuesday morning gathering.

A post-war symposium, presided over by A. M. Beebee, chairman, AGA committee on post-war planning, was the first topic on the conference's second-day program. Then came a talk, illustrated by lantern slides, by Dr. G. E. Seil, E. J. Lavino & Co., Philadelphia, on the subject, "X-Ray Diffraction Studies of Iron Oxide Used in Dry Box Purification."

The paper, "Natural Gasoline Enrichment of Producer Gas for Use in Underfiring Recuperative Type Solvay Coke Ovens," presented by W. O. Keeling, research department, Koppers Co., is printed, in part, in this issue, as is E. E. Witham's address on "Underfiring a Coke Oven Battery With Refinery Oil Gas." Mr. Witham is a member of the gas department of the Philadelphia Electric Co.

A. S. Hall, superintendent, Springfield Gas Light Co., Springfield, Mass., presented a paper entitled "Silicon Carbide Solid Linings for Water Gas Generators," and described the results of several such installations.

After a luncheon a special war conference, dealing with such subjects as maintenance during wartime, personnel problems, and post-war considerations was presided over by W. Cullen Morris, New York.

■ ■

Mid-West Gas Group Holds Sectional Meeting

At the annual meeting of the Mid-West Gas Association held in Omaha on April 12 it was decided to hold periodical sectional meetings for the key men of the various companies to hear speakers and discuss local problems. The first meeting of this nature was held at St. Paul, Minn., on June 11 at the St. Paul Hotel.

The committee, composed of D. R. Putnam and L. J. Eck, were in charge of the meeting and reports were given by members who attended the gas distribution and production conference in Cincinnati in late April.

AGA Annual Meeting Set for October 11-13

The 25th Annual Meeting of the American Gas Association will be held at the Jefferson Hotel in St. Louis on Monday, Tuesday and Wednesday, Oct. 11, 12 and 13, 1943.

St. Louis was selected by the Executive Board of the association as the city nearest the center of association membership affording adequate accommodations, resulting in conservation of time and travel.

In addition to the Jefferson, room reservations will also be available at the Lenox, Mayfair, Mark Twain and DeSoto Hotels, all first class and within easy walking distance of the Jefferson. It is expected that the program will be devoted entirely to discussion of war and postwar problems.

Oil Compact Commission Reports on Conservation

NECESSITIES of the war have lent great impetus to oil and gas conservation and secondary recovery efforts, according to facts made public by Charles Orr, secretary of the Interstate Oil Compact Commission, of Oklahoma City. Thirteen oil and gas producing states are now members of the commission.

Many of the facts were revealed at recent quarterly meetings of the commission, the most recent one at Wichita, Kan., April 2-3, 1943.

Since January of this year the commission has been putting out monthly a publication designated as the "Journal of the Research and Coordinating Committee," edited by E. G. Dahlgren, technical secretary, and J. B. Wilson, assistant.

The May issue gives statistics and reviews progress along these lines in Arkansas, Illinois, Kansas, Louisiana, Michigan, Montana, Mississippi, New Mexico, Ohio, Oklahoma, and Texas, all members of the Interstate Oil Compact Commission.

In Arkansas, March production from the 31 oil and gas fields of south Arkansas averaged 71,396 bbl. daily, a decrease of 3544 bbl. daily from the average February production. From the 21 gas fields of north-central Arkansas, 19,371,000 cu. ft. of natural gas were produced daily in March, compared to 21,928,000 cu. ft. for February, a decrease of 2,557,000 cu. ft. daily. Production of sour gas from oil and condensate fields decreased 36,626,000 cu. ft. daily for the same period. The decrease in production of sour gas, crude oil and condensate was due to the commission's order closing the Dorcheat-Macedonia, McKamie and Texarkana lime pools to conserve sour gas pending the completion of the McKamie gas cleaning plant and the Arkansas Fuel Oil Co.'s Columbia cleaning plant.

Col. E. O. Thompson, member of the Texas Railroad Commission, stated in an address at the April meeting of the Interstate Oil Compact Commission, held at Wichita, Kan., April 2-3, that conservation efforts of the Texas commission have added an estimated 2,000,000,000 bbl. to the ultimate recovery in the East Texas field.

■ ■

House Heating Group Elects Harry Wollman

At the regular monthly meeting of the Metropolitan House Heating and Air Conditioning Council held at American Gas Association headquarters in New York on May 19, Harry M. Wollman, Jr., house heating and industrial supervisor, Jersey Central Power & Light Co., was elected chairman for the ensuing year.

Other officers elected include: Vice chairman, William J. Schmidt, general sales manager, Long Island Lighting Co.; and secretary-treasurer, John J. Wholey, sales manager, Rockland Gas Co., Spring Valley, N. Y.

It was also planned to definitely hold the annual summer session and Henry Rohrs, Elizabethtown Consolidated Gas Co., was appointed chairman of the event.

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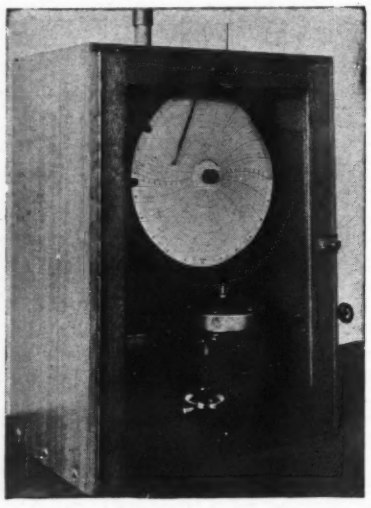


Once ARCCO-ANUBIS Gas Gravitometers are calibrated and properly installed they require no further attention than to change the chart, wind the Macnick chart clock, and ink the pen. Carefully constructed in our precision laboratory, and having no mechanical complexities such as electric motors or pressure-regulating valves, these Gravitometers are sturdy and will give long, trouble-free service.

These direct-weighing instruments produce highly accurate records of the specific gravity of gases on a circular chart that can be read directly to the second decimal place, and, by easy approximation, to the third decimal place. An automatic temperature-compensating pendulum controls the recording of the specific gravity of the gas, even under extreme conditions of temperature change.

Hundreds of ARCCO-ANUBIS Gas Gravitometers are in service in major company installations. Learn the sound reasons for their choice of these dependable instruments.

Send for Bulletin No. 101

AMERICAN RECORDING CHART CO.

3113 E. 11th St., Los Angeles, Calif.

Oil Compact Will Hold Pittsburgh Session June 26

HE summer session of the Interstate Oil Compact Commission will be held at the William Penn Hotel, Pittsburgh, Pa., June 26, Governor Andrew F. Schoeppel of Kansas, commission chairman, and Charles Orr of Oklahoma City, secretary, announced June 6.

Historical interest will be added to the meeting because Pennsylvania is the state where Col. Drake drilled the world's first oil well. Representatives of the various states which hold membership in the compact commission, including Ohio, which joined the compact recently, will discuss post-war problems relating to production and conservation of petroleum, gas, gasoline, and fuel oil.

Members of the commission also will attend the annual meeting of the Pennsylvania Grade Crude Oil Association in the William Penn Hotel, Friday, June 25.

The Interstate Oil Compact Commission's executive, legal, research, engineering, regulatory practices, and economics advisory committees will convene Friday to prepare their reports and recommendations.

The proposed educational program of the Interstate Oil Compact Commission will be further discussed. When completed, this program will "demonstrate that oil and gas conservation is necessary and desirable; that regulations to prevent waste is a state function; that the states with federal and industry cooperation are doing a good job; that the Oil Compact Commission is furthering a valuable interstate forum for the study and solution of conservation problems; and that by utilizing modern engineering efficiency, the petroleum industry is furnishing a vital and essential commodity at a low cost," said the April issue of the Interstate Oil Compact Commission Quarterly Bulletin.

■ ■

State of Ohio Joins Oil Compact Commission

The State of Ohio joined the Interstate Oil Compact Commission May 14, making it the thirteenth state to enter the compact. Other members of the commission are: Arkansas, Colorado, Illinois, Kansas, Kentucky, Louisiana, Michigan, New Mexico, New York, Oklahoma, Pennsylvania and Texas.

Ohio has had representatives present at several of the quarterly meetings of the commission, as observers. During the recent session of the Ohio legislature, Senate Bill No. 160 was passed authorizing the state to join the compact.

■ ■

Meter Association to Hold Election of Officers

The Southern California Meter Association will hold its next regular meeting at the Rio Hondo Club on June 17. The club will be open all day to members in preparation for the election of officers. Dinner will be served at 6:45 p. m., followed by balloting, and during the counting of the ballots a special program has been prepared by the entertainment committee.

■ ■

Krug Lauds Recent Gas Conservation Program

In a letter to the American Gas Association, J. A. Krug, director, Office of War Utilities, praised the recent efforts of the industry in promoting conservation of fuels during the past winter. His letter says, in part:

"The intensive advertising campaign to promote conservation carried on by your association and the gas industry during the past winter has been a splendid job.

"I am certain that a large measure of the success of many companies in meeting unprecedented demands for gas service is attributable to that campaign. In many cases, the emergency appeals by radio and in the press for voluntary domestic curtailment during the extreme cold weather assisted materially in assuring gas service for vital war plants and averted serious interruption of service for essential civilian requirements."

■ ■

PCGA Annual Meeting Set for September 22-23

THE 1943 Annual Meeting of the Pacific Coast Gas Association will be held Sept. 22 and 23 at the Ambassador Hotel in Los Angeles, according to Norman R. McKee, chairman of the association's arrangements committee. The meeting has been planned for Wednesday and Thursday in order to avoid week-end travel.

The meeting will open with a luncheon. A general meeting will be held in the afternoon and it is expected that outstanding speakers will be on the program. Plans call for the election of officers and the transaction of other business of the convention at this afternoon meeting. An informal dinner-dance will conclude the first day's activities.

Activities of the second day will include a general meeting in the morning, a business luncheon, and a series of parallel sessions held by the various sections of the association during the afternoon.

■ ■

Increase in Furnace Black Shown in 1942

According to a recent report issued by the Petroleum Economics Division of the Bureau of Mines, an increase of 7% was shown in the relative position of furnace blacks in the carbon-black industry last year. Furnace blacks constituted 24% of the total production last year, while the production of all types of carbon black declined 3%. Sales on carbon black declined 30% during 1942.

Some 335,533,000 cu. ft. of natural gas were burned in the manufacture of the 574,006,000 lb. of carbon black produced in 1942. This amount represents an 8% reduction in the quantity burned during 1941.

■ ■

Arthur Bridge Guest on "Fashions in Rations"

Arthur F. Bridge, president of the American Gas Association, was the guest speaker on Servel's national "Fashions in Rations" radio program on Saturday, May 8. He was interviewed by the star of the show, Billie Burke, and described briefly how the AGA and the gas industry are helping the war effort.

The program was broadcast from Hollywood over a coast-to-coast "hook-up" of the Columbia Broadcasting System.

■ ■

AGA 1943 Publications List

The American Gas Association has just issued its list of publications (1943). The list gives titles, authors and costs of studies made under the general headings of accident prevention, accounting, general, industrial and commercial, natural gas, industrial gas research, residential, statistical, technical, and testing laboratories. Copies may be obtained from the association headquarters, 420 Lexington Ave., New York City.

AGA Domestic Research Program Expanded

THE AGA program of fundamental research in the utilization of gas for domestic purposes is being greatly expanded through recent action of the Executive Board, according to an announcement by Everett J. Boothby, chairman, Committee on Domestic Gas Research and vice president and general manager, Washington (D. C.) Gas Light Co. Portions of research projects that have been under way for some time are being revamped and speeded up. In addition, other portions of these research projects are being rapidly brought to the point where intensive laboratory work can be undertaken at the earliest possible time.

The basic conception of AGA domestic gas research has been developed by the research committee over a period of several years through the assistance of a Technical Advisory Committee for each of the basic projects. These technical advisory committees are composed of utility and appliance manufacturing engineers and executives. From this basic conception has been developed comprehensive detailed working outlines for each section of projects in cooking, water heating, central space heating, direct space heating and atmospheric burners.

Under the new authority granted by the Executive Board, the cooking, water heating, central space heating and atmospheric burner research projects will be concentrated on for the balance of the year.

This extensive domestic gas research program is designed to overcome fundamental technical problems that limit the optimum application of gas in the home, and to provide the soundest possible technical foundation on which gas appliances of the future will be designed and built. These fundamentals consist of improved and new methods of combustion and improvement in the different possible methods of transmitting heat to cooking vessels, to hot water for domestic service, and to steam, water and air for househeating systems. They further consist of fundamental studies of new and improved methods of ignition, heat distribution, venting, etc., and the elimination of all noises of combustion, as well as other noises in appliances.

This research project is well advanced at the AGA Laboratories where the following projects have been assigned:

Domestic Gas Cooking Research.
Domestic Gas Water Heating Research.
Fundamentals of Atmospheric Gas Burner Design.
Research in Central Gas Space Heating.

Seven research bulletins have been completed and published in connection with this program. They are:

Domestic Gas Range Research (Bulletin No. 7).
Domestic Gas Range Research (Bulletin No. 8).
Fundamentals of Domestic Gas Water Heating (Bulletin No. 9).
Research in Fundamentals of Atmospheric Gas Burner Design (Bulletin No. 10).
Principles of Gas Storage Water Heater Design for Maximum Hot Water Delivery (Bulletin No. 12).
Fundamentals of Design of Atmospheric Gas Burner Ports (Bulletin No. 13).
Fundamentals of Automatic Flash Tube Lighter Design (Bulletin No. 14).

A large amount of completed laboratory research work is now being carefully analyzed and reviewed by the Laboratories staff, the Technical Advisory Committee and the Committee on Domestic Gas Research. As this completed work clears through these various steps, additional research bulletins will be published as rapidly as possible for the benefit of the industry. Under the accelerated pace of the program, the number of research bulletins and reports will increase considerably.

There have been advanced many ideas for post-war domestic gas appliances. Some of these are of such a nature that they can be applied by manufacturers immediately, if it can be shown that a market exists for them. Other ideas that have been advanced depend for fruition upon the successful development of certain definite, fundamental, technical facts that at the present time do not exist. This creates bottlenecks that when broken will automatically open up large fields of applied research, advanced development, and the application of ingenious and novel ideas.

The working outlines of this expanded and accelerated domestic program of fundamental research have been laid out in detail for a period extending more than a year beyond the actual current laboratory work. These working outlines are changed from time to time by the Research Committee as work advances, the changes made being largely the results of continued studies by the individual technical advisory committees.

■ ■

Wisconsin Gas Excise Tax

The Assembly passed the Double and Lenroot Bill providing an excise tax of 7¢ per Mcf. on natural gas in Wisconsin.

The bill, which prohibits the sale of natural gas or natural gas mixed with manufactured gas without permit from the Public Service Commission and approval of municipal governing body, has been signed by the governor of Wisconsin.

Gas Industry of the West Meets War Emergency With Fast Teamwork

Streamlining its activities in keeping with the fast pace of today, the P. C. G. A. has now substituted frequent, compact invitational committee meetings for its regular annual Convention.

LICKING WARTIME PROBLEMS

Among the subjects on which experience and ideas already have been exchanged are:

Manpower • Priorities
Dehydration of Vegetables
Nutrition (Home Service)
Utilization • Accounting
Dealer Cooperation
Production (including a report to the OCD on dim-out cooperation.)

Such meetings can be called on short notice, to discuss any problem that may arise.

THE PACIFIC COAST GAS ASSOCIATION

SERVING THE WEST - IN WAR AND PEACE

GAS FUEL

LATEST GOVERNMENT FOOD COMMUNIQUÉ DIRECT FROM THE DEPARTMENT OF AGRICULTURE EACH WEEK

Every Saturday morning, an official spokesman of the U. S. Department of Agriculture broadcasts up-to-the-minute food news direct from Washington on "Fashions in Rations."

This unusual radio feature, made possible through the co-operation of our government's Office of War Information, brings to listeners everywhere first-hand information on rationing, shortages, changed point values, Victory gardening, and new food regulations.

Both because of its timeliness and practical value, this weekly government food communiqué provides a real service to gas customers . . . and one which will be increasingly appreciated and depended upon as the weeks go on.

talk about food...
EVERYBODY LISTENS!

That's why millions tune in every Saturday to the new radio program for Gas and Gas Service

"FASHIONS IN RATIONS"

With Billie Burke as Mistress of Ceremonies

Over 68 CBS Stations
11:30 A.M. Eastern War Time

WITH FOOD RATIONING AND FOOD PREPARATION uppermost in the minds of American home-makers, "Fashions in Rations" is one of the most timely radio programs for women on the air today.

It gives home-makers *official* last-minute news about food, direct from the Department of Agriculture in Washington. It brings them the views of food leaders in the field of government and industry. And there are answers to important questions on point-budgeting, meal planning and nutrition by Alice White, Servel's Home Volunteer Food Adviser.

There's laughter and entertainment on "Fashions in Rations," too. Billie Burke, star of stage, screen and radio, plays the part of a point-perplexed housewife. With her cook, Jefferson James, she gets into amusing situations about food and rationing that provide plenty of chuckles—and worthwhile food lessons.

In addition, home-makers get the facts about *local* food conditions direct from Gas Company home consultants through local station "break-ins." This gives Gas Companies the chance to deliver their own message—enables them to invite their customers to their showrooms for further help and guidance.

Sponsored by **SERVEL, Inc.** **AND GAS COMPANIES FROM COAST TO COAST**

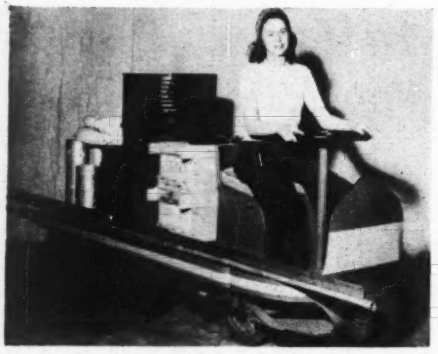
PRODUCTS

Platform Truck

Rocky Mountain Steel Products Co., 1346 Wall St., Los Angeles, Calif.

Model: Blue Streak.

Application: For moving raw materials within or around industrial plants. Can be used



on balconies, freight elevators and through offices.

Description: This truck is electrically operated and is fumeless, flameless, clean, and quiet. Its small turning radius offers maneuverability under crowded conditions and in restricted areas. It features an 18 sq. ft. platform of half-ton capacity, has four forward and reverse speeds, and was designed to meet the wartime necessity for female operators.

The truck is provided with a seat, steering wheel and foot throttle and operates like an automobile. Standard equipment includes combined foot and hand throttles, hydraulic brakes, parking brake and electric horn. One set of 24-volt batteries is furnished with each vehicle, and these can be recharged without removal through a built-in plug at the front, while the truck is idle.

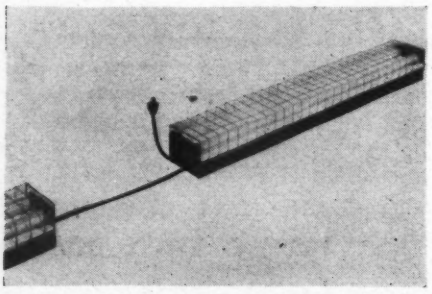
■ ■

Combination Light

Lumidor Mfg. Co., 3120 E. Pico Blvd., Los Angeles, Calif.

Model: Double-circuit Mechanic's Light.

Application: Originally designed to illuminate fuselage interiors of large aircraft dur-



ing construction, the unit can be adapted to a wide variety of industrial uses. In addition to its primary purpose of illumination, it has receptacles for plugging in small power tools and other electrical fixtures.

Description: The light comes in two sizes: a 24-in. unit containing two 20-watt lamps, and a 48-in. unit containing two 40-watt lamps. Both units are available for either 50 or 60 cycle current, and are high power factored to eliminate flicker. Brackets for hanging and a hinged wire lamp guard are standard equipment. As many as four lights can be connected to a maximum of 60 ft. from a single outlet.

■ ■

Masks and Caps

Aldine Paper Co., 373-75 4th Ave., New York City.

Model: Aldex Washable Paper Masks and Caps.

Application: For protection of employees from dusts and moving machinery.

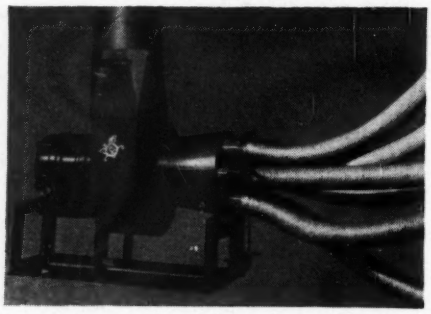
Description: These caps and masks are fashioned of a vegetable fiber paper product which it is claimed can be stitched, washed and ironed. Tiny pores permit free air passage but exclude dust particles of ordinary size. Wearers can converse through masks.

■ ■

Fume Exhauster

Chelsea Fan & Blower Co., Inc., 1206 Grove St., Irvington, N. J.

Model: Improved Fume Exhauster.



Application: For removing fumes from shipholds, welding rooms, tunnels, vaults, basements, etc.

Description: The newly developed centrifugal type blower wheel of this unit is made of ⅛-in. thickness steel; 3-hp. ball-bearing motor is tested to an overload capacity to meet rough usage. Framework is welded into a strong, heavy unit fitted with handles for carrying.

Adapters are interchangeable and can be used for suction or blowing as desired. New features of this unit are the fact that the fumes, gases, dust, filings and grinding compounds do not come in contact with the motor.

■ ■

Motorized Scooter

Cushman Motor Works, Lincoln, Neb.

Model: "Auto-Glide" Scooter.

Application: For use by maintenance men, foremen, messengers, clerks, etc., in interdepartment travel.

Description: This two-wheeled vehicle is claimed to be capable of thousands of miles of service. Adjustment of the engine connecting rod, at the crankpin end, is made by laminated shim which is installed in the original assembly. Easy maintenance is provided by simply peeling the shim for close, accurate fit. Shim is made by the Laminated Shim Co., Glenbrook, Conn.

■ ■

Self-Adhesive Stickers

Avery Adhesives, Los Angeles, Calif.

Model: "Kum-Kleen" Stickers.

Application: For patent and serial number labels, operating instructions, specifications, etc., to take the place of decalcomanias now limited by WPB Order No. M-241-a.

Description: Available in stock or special sizes, shapes and colors, these self-adhesive labels require no moisture to adhere to any smooth surface such as metal, wood, glass, plastic and paint. They can be peeled off for reuse without tearing or scraping. They are not affected, it is claimed by the maker, by extreme cold, heat or humidity, and when covered with varnish are impervious to salt water.

■ ■

Paint Spray Booth

Mayer Mfg. Corp. (Aqua-Restor Division), 56 Division Place, Brooklyn, N. Y.

Model: Type FLRS-7.

Application: To meet high-speed, high-standard war production paint spraying requirements.

Description: Type FLRS-7 Aqua-Restor paint spray booth features rear and side water-impingement walls and employs a patented super-turbulent chamber that offers maximum painting speed with greater safeguards for workers. Fire hazards are said to be greatly reduced. In operation, the side and rear walls are continuously covered with a sheet of controlled water.

Absence of spray nozzles and moving parts reduces work stoppages for servicing to a minimum, and additional economies are said to be effected through low horsepower pumping needs. Reclamation averages for all types of pigments are claimed to be high. One model is standard floor type, available in all sizes, and comes equipped for fluorescent lighting.

Catalogs

• Wheelco Instruments Co., Harrison and Peoria Sts., Chicago, has issued five new bulletins describing its complete line of industrial indicating, recording and control thermostats. Bulletin G23-2, of 12 pages, discusses the operating principle of Wheelco thermometers and gives information to aid the user in selecting the proper instrument for his application. A table gives complete details of the characteristics, performance and limitations of each class of vapor-pressure and gas-filled instruments. Similar information to aid in the selection of bulb and socket materials, and of capillary and its armor, is also included. Available scales for indicating instruments and charts for recording instruments are illustrated.

Bulletin G503-2 covers the company's recording control thermometer, while G603-2 is on the indicating control thermometer. Both bulletins, of eight pages each, discuss the company's "electronic principle" of effecting control without mechanical contact between measuring and control sections of the instruments. Schematic drawings are included. Bulletin G303-2, two pages, describes and gives applications for the company's indicating thermometer, while Bulletin G403-2, two pages, covers its recording thermometer.

• Leeds & Northrup Co., 4934 Stenton Ave., Philadelphia, Pa., has released an entirely new 29-page catalog, "Micromax Electric Control." It describes control equipment capable of handling any process which can be controlled by positioning a valve or other regulating device, a control which holds smoothly and surely at the control point, under either transient or sustained changes in demand. Diagrams and text explain in detail how the equipment is adjusted to fit the needs of a particular process. And a number of pictures show the equipment in actual use in a wide variety of applications.

• Cochran Corp., 17th and Allegheny Ave., Philadelphia, has published Bulletin 4009, descriptive of proportioning equipment of the double displacement type for acids, corrosive liquids and other clear solutions. This type eliminates pumps and moving parts, and depends on the proportioning of one fluid to another by utilization of the pressure loss through a metering element, such as an orifice or Venturi tube.

The proportioning is by displacement in which two tanks are utilized and the chemical solution separated from the water by a layer of thin oil, such as kerosene. The apparatus is designed for the incorporation of a pH controller, making it accurate and sensitive. With this addition it is claimed the pH value can be maintained in the water treated at a constant value irrespective of changes in rates of flow and changes in the pH value of the water to be treated.

• Leeds & Northrup Co., 4934 Stenton Ave., Philadelphia, Pa., has just issued a catalog which describes recent improvements in Micromax CO_2 recording equipment. The catalog, N-91-163, "Micromax CO_2 Recording Equipment for Flue-Gas Analysis," states that heavy-walled glass tubing in shock-absorber mountings now brings the continuous flowing flue-gas sample from primary filter to cell assembly. Three-way cock for check purposes and condensate drain, previously of metal and external to the cabinet, are now of and Repairs; Specifying New Conveyor Belts; Condensed Conveyor Belt Data; and Elevator Belts.

• Precision Scientific Co., 1750 N. Springfield Ave., Chicago, has issued catalog 325, containing 48 pages of illustrated matter pertaining to "Precision" Freas constant temperature control cabinets. The catalog also includes an extensive variety of standard models, as well as many photographs of constant temperature cabinets. Included also is general information on mechanical and gravity convection heat transfer.

• American Automatic Typewriter Co., 614 N. Carpenter St., Chicago, has issued Bulletin 10, describing its new bellows-type vacuum pumps. Designed for production and laboratory applications, the pumps are available in three standard sizes. The bulletin describes construction features and gives a table of specifications for each model.

• Mine Safety Appliances Co., Pittsburgh, Pa., has published a comprehensive 32-page handbook entitled "How to Make Your Safety Equipment Last Longer." The booklet is ready for wide distribution to industry without charge, as a public service. Covering every type of personal protective equipment, from protective hats, gas masks, respirators and gas instruments, through the list of safety clothing, this well-illustrated publication details the practical "do's" and "don'ts" of safety equipment care for key personnel, in a form readily adaptable for instruction of equipment users. The section on various methods of sterilization of masks and respirators is thoroughly handled, and attention is given to many common-sense methods for repair and preventive maintenance of articles on the hard-to-get list.

Gas is Ammunition
don't waste it
save gas with Carboseal Anti-Leak

YOU can prevent the loss of a vital war material — gas — by using CARBOSEAL Anti-Leak to stop the leaks in the bell-and-spigot joints of dry-gas systems. CARBOSEAL Anti-Leak is a liquid that penetrates the cells of the hemp and jute fibres in the joint packing and causes them to swell approximately 44 per cent in volume, thereby sealing leaks.

CARBOSEAL Anti-Leak is especially recommended now as a gas-saver because . . . only a small crew is needed to apply it . . . critical materials are not needed . . . the cost of the treatment is low, averaging about 50 cents per joint . . . and excavation and repaving are practically eliminated.

TABLE OF LEAKAGE REDUCTION		
Diameter of Main—Inches	Length of Main—Feet	Percentage Leak Reduction
8	620	100
6	582	95
6	92	100
4	1,200	100
4	1,700	91
3	618	100
3 equiv.	43,800	60

CARBOSEAL Anti-Leak works. Reports show that joints in mains treated seven years ago are still tight. The Table of Leakage Reduction, compiled from hundreds of test results on file, indicates results typical of general field experience.

Over 250 gas companies now use CARBOSEAL Anti-Leak in their routine maintenance programs.

For further information on the uses of the Anti-Leak and methods for applying it, write for the book, "Correcting Leakage in Gas Distribution Systems with CARBOSEAL Anti-Leak."

CARBIDE AND CARBON CHEMICALS CORPORATION

Unit of Union Carbide and Carbon Corporation

30 East 42nd Street UCC New York, N. Y.

The word "Carboseal" is a registered trade-mark of Carbide and Carbon Chemicals Corporation.

PRODUCERS OF SYNTHETIC ORGANIC CHEMICALS

PEOPLE

Harold W. Wickstrom has been named manager of the pipeline and refinery division of Swinerton & Walbert Co., engineering construction firm of San Francisco. In this position Mr. Wickstrom will superintend construction of 82 miles of the "Little Big Inch" war emergency pipeline from Cape Girardeau, Mo., to Norris City, Ill.

H. W. Wickstrom

Before joining Swinerton & Walbert Co., Mr. Wickstrom acted as consulting engineer for many important LP-gas projects on the Pacific Coast, his last being the installation in California of a huge underground storage for petroleum products for the navy, under a contract held by the Southwest Engineering Co., Los Angeles.

He has been technical editor of *Butane-Propane News* since it started publication more than four years ago. He has served also as technical advisor to the editors of the *Handbook Butane Propane Gases.*

• •

Gordon Lefebve has been elected president and general manager of the Cooper-Bessemer Corp., succeeding **B. B. Williams.** Mr. Williams will remain as chairman of the board.

Mr. Lefebve has been connected with Cooper-Bessemer for the past 19 months, prior to which he was in charge of the diesel engine division of the American Locomotive Co.

• •

A. E. Bedell has been appointed chief engineer for the Graver Tank & Mfg. Co., Inc., East Chicago, Ind. He will have charge of all engineering and development work in the various branches of the firm.

• •

The appointment of **Hubert C. Davis,** formerly sales supervisor for the Lone Star Gas Co.'s Waco division, as manager of the Ennis district has been made known. Mr. Davis succeeds **L. D. Black, Jr.,** who resigned to enter the U. S. Coast Defense at Camp Wallace, Galveston.

• •

Larry Ladewig, house heating and air conditioning engineer, Houston Natural Gas System, Houston, Texas, will in future be associated with the company's industrial sales department under the supervision of **J. M. Robertson.**

F. D. George, for the past five years an industrial salesman in Mr. Robertson's department, has been assigned to commercial and residential sales as new business representative. His work will be under the direction of **E. N. Heard** and **W. S. Keenan.**

• •

Dr. William R. Hainsworth, vice president in charge of engineering and research, Servel, Inc., Evansville, Ind., has been named chairman of the Industrial Research Institute. The institute is made up of research executives representative of various types of industrial firms and industrial areas, organized for the purpose of cooperative study of their common problems.

Dr. Hainsworth has been associated with Servel, Inc., since 1926. In 1933 he was awarded the Charles A. Monroe Award of the American Gas Association for improvements in which the principle of air cooling displaced use of water in gas refrigeration.

• •

E. L. Harpold, assistant supervisor of stores, Lone Star Gas Co., Dallas, has obtained a leave of absence from his company to serve in the Utilities Inventory Control Department of the WPB.

B. K. Inman, field supervisor for the stores department, will serve as assistant superintendent, and his duties as field supervisor will be assumed for the duration by **A. L. Williams,** district storekeeper at Ranger, Texas.

• •

Elmer (Trim) Capshaw has been appointed gas engineer of the oil and gas conservation department of the Oklahoma Corporation Commission. His first job will be to aid engineers of the United States Bureau of Mines in recent shut-in tests in the West Cement oil and gas field in Caddo County, Okla.

Mr. Capshaw is functioning as the first gas engineer of the commission. Heretofore gas and electric engineering duties were combined in one office. The oil and gas conservation department, under **Walker T. Pound,** chief conservation officer, has taken on new importance, since war needs have laid particular emphasis upon the necessity for preventing waste of oil and gas and assuring new supplies to meet war demands.

Elmer Capshaw

A native of Norman, Okla., Mr. Capshaw was educated in the University of Oklahoma, became superintendent of schools in that university city, and nine years ago was appointed a deputy conservation officer of the Oklahoma Corporation Commission. His duties were to enforce the laws and orders of the corporation commission with regard to conservation of natural gas. He spent two weeks in the West Cement field, when beginning May 18, all gas wells producing from the Madrano sand were completely shut down for tests to determine whether an unnecessary waste of oil or gas, or both, was occasioned by permitting these wells to produce their allowables.

• •

P. McDonald Biddison, formerly a consultant in the power branch of the gas supply section of the WPB, has established new headquarters in Chicago, where he will conduct his private business as an engineering consultant in natural gas and petroleum and in utility rate matters. Mr. Biddison's new address is 3913 Field Bldg., 135 S. La Salle, Chicago.

P. M. Biddison

Prior to joining the WPB last October Mr. Biddison was consulting engineer for Lone Star Gas Co., Dallas, Texas, and had been working with valuation of properties and rate cases on natural gas utilities.

• •

Reinhard L. Heeren, purchasing agent, Brooklyn Union Gas Co., Brooklyn, N. Y., was appointed acting construction engineer on May 24. He will remain as head of the purchasing department and, in addition, will supervise the work of the construction department.

Mr. Heeren is a civil engineer and for eight years prior to his appointment as purchasing agent was assistant construction engineer for Brooklyn Union.

• •

F. D. Bradley, who has been manager of the Southern Union Gas Co.'s purchasing department for 14 years, was elected president of the Dallas Purchasing Agents Association for the current year.

• •

Fred Polonus has been appointed purchasing agent of the Central Illinois Light Co., Peoria, Ill., to succeed the late **Walter Fenelon.**

Mr. Polonus received his 20-year service pin from the company in September, 1943, and has been connected with the purchasing department since October, 1923.

• •

Thomas S. Lever, Jr., controller of the Philadelphia Gas Works has been elected a director of the Philadelphia Control of The Controllers Institute of America.

• •

Paul R. Taylor, Upper Montclair, N. J., has been appointed director of the Natural Gas Division of the Office of War Utilities, according to an announcement by J. A. Krug, director.

Mr. Taylor, vice president of Stone & Webster Service Corp., New York, is a native of Indiana and a graduate of Purdue University in mechanical engineering. He served in the aviation section of the Signal Corps in World War I, and after the armistice became city manager of Grand Haven, Mich., where he had charge of municipal water and electric utilities from 1920 to 1928. In 1928 he became affiliated with National Gas & Elec-

"What's more, IT CAN NEVER RUST!"

Johns-Manville

TRANSITE FLUE PIPE

AN ASBESTOS PRODUCT

For venting gas-burning appliances

.complete

for every Gas control requirement

REYNOLDS Builds a Regulator for every type of Gas Control Installation. Proved by records of performance in actual operation, or by records of factory tests on new developments, every REYNOLDS unit—whether for high pressure or low—is a proved product.

Long life, efficient operation, accurate regulation, reasonable cost, low upkeep—these are the vitally important inherent features built into REYNOLDS Gas Regulators through more than 50 years of experience in developing, designing, building and testing Gas Control equipment.

Reynolds Products...

- High Pressure Service House Regulators: Straight Lever Type—Models 10-20 Series. Toggle Lever Type—Model 30 Series
- Low Pressure Service or Appliance Regulators
- District Station Regulators, Single or Double Valve, Auxiliary Bowl and Automatic Loading Device Optional
- High Pressure Line Regulators Pilot Loaded—Pilot Controlled
- Toggle Type Regulators. Single Valve, Double Valve, Triple Outlet
- Seals: Dead Weight or Mercury
- Relief Valves: High or Low Pressure
- Back Pressure Valves. Automatic Quick-Closing Anti-Vacuum Valves
- Automatic Shut-off Valves
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- Louver Operated Device
- Atmospheric Regulators
- Vacuum Regulators

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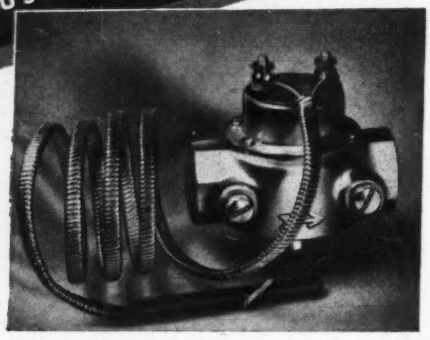
R

REYNOLDS GAS REGULATOR COMPANY

☆ ANDERSON, INDIANA, U. S. A. ☆

GAS CONTROL SINCE 1892

MR-2 AUTOMATIC GAS SHUT-OFF FOR WATER HEATERS, FLOOR FURNACES AND HOUSEHOLD APPLIANCES....

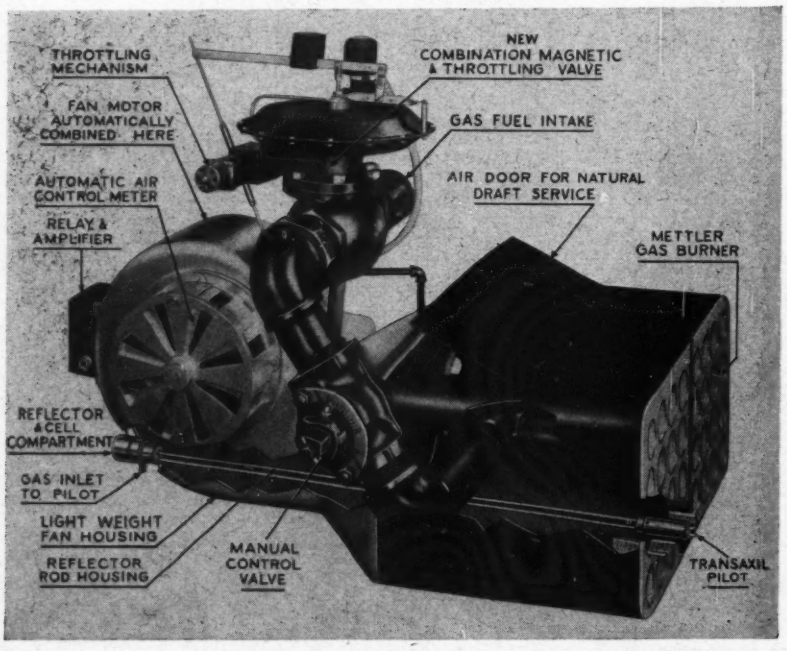


Necessary valve operating current is supplied by heat of pilot flame applied to thermocouple element. Failure of flame automatically closes valve which can be again opened by convenient push button. MR-2 is straight through gas type. Standard thermocouple length 30". Valve sizes: ⅜" to 1½". Available for manufactured or liquefied petroleum gases.

Write for Catalog No. 52

GENERAL CONTROLS
801 ALLEN AVENUE • GLENDALE, CALIFORNIA
Branches: Boston • New York • Philadelphia • Cleveland
Detroit • Chicago • Dallas • Denver • San Francisco

THE METTLER "FAN-AIR"
Features
A Modern Complete Gas Burner System



The above picture reveals some *points* of simplicity and flexibility of the FAN-AIR MECH'L DRAFT AUTOMATIC BURNER ASSEMBLIES, justifying your sponsorship. The Burners, Controls and Safety Pilot are scientifically coordinated.

All Sizes Available for Immediate Delivery

LEE B. METTLER CO.
LOS ANGELES — 406 South Main Street — CALIFORNIA

tric Corp., Benton Harbor, Mich., as assistant general manager and later as vice president and general manager.

The new natural gas director is a member of the American Gas Association and the Society of Gas Lighting.

• •

H. L. Masser, executive vice president of the Southern California Gas Co., Los Angeles, has been appointed chairman of the general post-war planning committee of the Pacific Coast Gas Association. The committee is now in the process of being formed.

• •

Election of **Ben R. Newbery**, Dallas, purchasing agent, Lone Star Gas Co., as president of the National Association of Purchasing Agents was announced at the annual meeting in New York on May 25. He succeeds **Roy Haberkern,** purchasing agent, R. J. Reynolds Tobacco Co., Winston-Salem, N. C. The association has 7000 members and includes Canada.

Ben R. Newbery

Mr. Newbery was district vice president and financial officer for the national organization in 1941-42, and only last year was awarded a certificate in appreciation of his services to the national association. He is a charter member of the Dallas Purchasing Agents Association, serving as its president in 1929. **F. D. Bradley,** purchasing agent for Southern Union Gas Co., is now president of the Dallas organization.

Mr. Newbery has been with the Lone Star Gas Co. almost 28 years. He is a leader not only in the purchasing field but also in many civic undertakings.

Obituaries

L. S. Stiles

Linford S. Stiles, construction engineer, Brooklyn Union Gas Co., died suddenly on May 5. He had taken ill the preceding evening while attending a dinner meeting of company department heads. He was 70 years old. Mr. Stiles joined Brooklyn Union in 1903 as a draftsman and in 1908 was made construction engineer, in which capacity he supervised the erection of many company properties. He was a member of the American Society of Mechanical Engineers and the American Society of Civil Engineers.

■ ■

John E. Zimmermann

John Edward Zimmermann, chairman of the board of United Gas Improvement Co., passed away May 30 in Philadelphia. He was 69 years old.

Mr. Zimmermann became president of U. G. I. in 1929 and was elevated to board chairman in 1940. Prior to his affiliation with U. G. I. he was a member of the engineering and construction firm of Day & Zimmermann. He was born in Buenos Aires, being educated at the University of Buenos Aires and at the University of Pennsylvania.

One of the advertisements produced in the 1943 series of the Pacific Coast Gas Association. This advertisement appeared in Sunset, California Parent-Teacher, and California Federation News. The copy was prepared by Knollin Advertising Agency.

Robertshaw Issues Kitchen Equipment Operating Charts

IN AN effort to assist inexperienced commercial and institutional kitchen operators and at the same time stem the tide of food and fuel waste, the Robertshaw Thermostat Co., Youngwood, Pa., has launched an educational program.

This program as explained by W. D. Crouch, manager, Robertshaw Industrial and Commercial Division, consists of five complete but simple and understandable charts covering the correct operation of thermostatically equipped roasting and bake ovens, deep fat fryers, coffee urns and steam tables. The aim of the charts is to simplify the management's problem in traing new employees.

The Robertshaw charts are 10 by 15 in. in size, printed in two colors, varnished for durability, punched for easy hanging, and have been compiled from authoritative information. A slight charge is made toward cost of production, handling and mailing. Utility companies desiring information about sets for distribution to commercial customers may write the company at 30 Church St., New York.

■ ■

Nutrition Manual Prepared For Industrial Use

"Manual of Industrial Nutrition" is the first of a series of pamphlets which will be prepared and distributed by the Nutrition in Industry Division, Nutrition and Food Conservation Branch, Food Distribution Administration, Washington, D. C.

Valuable data relating to war workers' nutrition are covered under the following headings: The National Nutrition Program for Industry; Basic Considerations for an "In-Plant" Nutrition Program; Some Special Considerations in Industrial Nutrition; Suggestions on "In-Plant" Feeding; The Conservation of Essential Food Factors in the Preparation of Foods for Human Consumption; Is There a Nutrition Problem in the United States?; Sources of Information and Materials; and Addresses of Regional Officers of the Food Distribution Administration.

Actual Case History

Shown here is a view of the job that was completed in 1 hour and 55 minutes with a Greenlee hand operated Model 790 Pusher. The pipe size was 2" and distance of push 88 feet. Without aid of peep-holes, pipe was pushed directly into a small opening in basement of the building. Location of job—Chicago, Touhy Avenue at Central.

PUSHING TIME 1 HR. 55 MIN.

A TYPICAL PERFORMANCE RECORD FOR GREENLEE HYDRAULIC PIPE PUSHERS

★ It is not unusual to complete a job in record time with a Greenlee Hydraulic Pipe Pusher, because there is no time wasted . . . no digging or back-filling of extensive trenches, no pavement cutting, no tunnelling, no repaving. Only a short trench is dug to accommodate pusher and pipe. No extra power equipment of any type is required, and one man can operate. Yes, time and manpower are saved with a Greenlee Pusher —*savings that often pay for the pusher on the first or second job.* Two models are available —Model 790, 20-Ton unit for 1¼" to 4" pipe; Model 795, 75-Ton unit for drainage ducts, concrete sewer, and other pipe beyond 4".

Write Today for Complete Information and Bulletin S-117

Greenlee TOOL CO.

1946 Columbia Ave. • Rockford, Illinois

War!

DEMANDS

CAREFUL REGULATION OF NECESSARY MATERIAL

H-M Low Pressure Regulator
Sizes from ⅜" to 2"

H-M THERMO CONTROL REGULATOR CO.

Engineers have met this demand in producing this H-M Low Pressure Gas Regulator.

H-M Regulator controls gas economically and efficiently reduces trouble and expense.

All Sizes Are Still Available

H-M REGULATOR COMPANY
THERMO CONTROL CO.
800 EAST 108 STREET • LOS ANGELES, CALIFORNIA

Metal Heating Research Project Authorized

A NEW research project for the investigation and development of the possibilities inherent in heating steel and other materials with gas at speeds heretofore unattainable has been authorized by the executive board of the American Gas Association. Announcement of this new project, the 48th to be sponsored by the AGA committee on industrial gas research, was made by Chairman John W. Batten.

Recent developments in the metallurgical field have caused some heating practices of long standing to be questioned. Among them are the rates at which metals can absorb heat and the practical value of the customary "soaking period." It is the belief of many advanced thinkers that a number of the long-established heating cycles can be greatly reduced in time, with important metallurgical and economic benefits, subject only to the ability to force heat into the materials at accelerated rates. To the extent that this is true many heat treating cycles can be cut from customary extended lengths of time down to a matter of a few minutes. The complete change in heating cycles, it is believed, will overcome a number of distinct metallurgical disadvantages.

Indications that gas has great possibilities in the field of high speed, direct heating, have been forthcoming from preliminary work carried out in laboratories and in a number of mass production factories. Enthusiasts think this will be the next noteworthy movement in industrial gas heating, comparable with the introduction of mechanical furnaces, circulating air heaters, radiant tube heating, etc.

The general objectives of the project have been set forth as follows:

1. To establish the effects of high-speed, direct heating with modern gas-air combustion on the metallurgical, working and production properties of ferrous and nonferrous metals (both standard and national emergency types) as heated for forging, normalizing, annealing, hardening, drawing, rolling, extruding, etc.

2. To compare these effects with the corresponding effects of conventional furnace heating and of other methods of high-speed heating such as electric induction and oxy-acetylene, and to study their relative merits.

The Committee on Industrial Gas Research has assigned this research project to the engineering laboratories of The Selas Co., Philadelphia. Details are being handled by a subcommittee composed of J. P. Leinroth, Charles C. Krausse, Charles R. Bellamy, F. W. Marklin and Eugene D. Milener. Work on the project will begin immediately.

■ ■

Handbook for Welding and Cutting Operator

The International Acetylene Association has prepared a convenient 20-page, pocket-size booklet entitled "Handbook for the Welding and Cutting Operator." Written in an easy-to-understand style, it contains a list of concise do's and don't's for the man who wields the blowpipe and a wealth of other helpful information and suggestions on the care and maintenance of blowpipes, regulators and welding and cutting accessories.

A copy of this handbook may be obtained in reasonable quantities without charge from any manufacturer of oxygen, acetylene, carbide or welding and cutting apparatus and supplies. Or write to International Acetylene Association, 30 East 42nd St., New York.

■ ■

Company Aids Bond Drive

Southern Union Gas System was one of the many utility companies taking an active part in assuring the success of the Second National War Bond Drive. Purchases totaling $200,000 were made by this company in the various communities served by it, thus assisting each district in reaching its quota.

Southern Union employees bought additional war savings bonds in the recent drive.

EDITION

Handbook
Butane-Propane Gases
Entirely Rewritten

481 PAGES OF UP-TO-DATE LP-GAS INFORMATION, CHARTS, DIAGRAMS and PHOTOGRAPHS **$5.00**

CHECK THE NEW CONTENTS

PART 1. INTRODUCTION
Chapter 1: The Progress of the Industry and the History of Its Development.
Chapter 2: The ABC of LP-Gas, an Introduction to LP-Gas Operations.

PART 2. PHYSICAL AND CHEMICAL PROPERTIES
Chapter 1: Properties of the Hydrocarbons in LP-Gas.
Chapter 2: Properties of Butane-Propane Mixtures.
Chapter 3: Volume Correction Factors.
Chapter 4: Analytical Determination and Testing.

PART 3. PRODUCTION OF LP-GAS
Chapter 1: Natural Gasoline Plants, Recycling Plants, Oil Refineries.

PART 4. TRANSPORTATION AND STORAGE
Chapter 1: Delivery by Truck, Rail, Water, and Pipeline.
Chapter 2: Storage Tank and Pressure Vessel Design.
Chapter 3: Liquid Metering and Pumping Systems.

PART 5. DISTRIBUTION OF LP-GAS
Chapter 1: Installing and Servicing LP-Gas Systems.
Chapter 2: Semi-Bulk Systems.
Chapter 3: Bottled Gas Systems.
Chapter 4: Gas Utility Service From Central Plants.
Chapter 5: Multiple Utility Service From a Central Plant.

PART 6. UTILIZATION OF LP-GAS
Chapter 1: Comparative Performance With Other Fuels.
Chapter 2: Appliance Installation and Testing.
Chapter 3: Domestic Applications.
Chapter 4: Commercial Applications.
Chapter 5: Industrial Applications.
Chapter 6: Enrichment, Peak Load and Stand-by Uses.
Chapter 7: A Fuel for Internal Combustion Engines.

CHAPTER 7. REGULATIONS
Section 1: N. B. F. U. Pamphlet No. 58.
Section 2: Motor Carrier Regulations.
Section 3: Freight Regulations.
Section 4: Unloading Tank Cars.
Section 5: Marine Regulations.

PART 8. APPENDIX
Section 1: Products Liability Insurance.
Section 2: Handy Tables for Field Use.
Section 3: Bibliography.
Section 4: Glossary of Terms.

CATALOGUE SECTION
A comprehensive presentation of LP-Gas appliances and equipment by the manufacturers of the LP-Gas Industry's best known products.

We pay postage on orders accompanied by check or money order. In California add 3% for sales tax. In Canada add 10% for excise tax.

Laclede Gas Co. Reorganizes Customer Service

CUSTOMERS of Laclede Gas Light Company, St. Louis, who wish gas connections or special accommodations are now handled swiftly by a new "streamlined service system" developed by the Customer's Service Department.

Approximately one-third more people per hour are being put though, highly important in these days of vastly more customers per day. Under the plan formerly used, 14 advisers who expedited service were located on a first floor balcony, convenient to the elevators. There was a desk at front, from which a floorman greeted incoming customers, asked them which service was wanted, and directed them to the proper employee. However, because there was no concrete means of identifying which adviser was in charge of the particular service, the floorman had to point him out, or tell the customer to go to the fifth desk on the right, etc.—sometimes confusing and wasting valuable time. Also, when some of the advisers were tied up, there were likely to be knots of impatient customers standing by the desk awaiting service.

A modern electric intercommunication system and a new arrangement of the department put an end to these drawbacks when E. L. Ramsey, head of the Customer Service Department, reorganized it. Now, there is a capacious waiting space with comfortable lounges, in which is a receptionists' desk. A young woman employee meets each customer there, inquires her purpose, and immediately gets the wheels in motion to complete the job.

In two rows behind her are the fourteen desks, now set at a 45-degree angle so that every customer can see a large white numeral on a card attached to the side of each desk. To prevent confusion or waste of time, the receptionist used a customer list form, which has spaces for the customer's name and address, and the number of the adviser to whom he will be sent. She jots the name down immediately, and invites the customer to sit down until the pertinent adviser is free for service. The number is filled in later. Each customer in this way, is served in the order in which he arrives, or in special cases, given preference.

Located on the wall above the receptionist is a small intercommunication signal box, wired in series with all desks, and bearing the numbers on a glassed-in face. Whenever an adviser is free to talk to a new customer, he simply presses a button installed under the corner edge of his desk, and the white arrow mechanism on the intercommunication signal box points out his number. The customer is immediatel sent to him. Then the receptionist presses another button on her own desk which clears the signal system for the next adviser to use.

Under this plan there is absolutely no waste time, according to Mr. Ramsey, inasmuch as the signal can be used to bring in one customer as the previous one gets up to leave. Where a lot of ill will can be created by leaving customers to wait for service, the new plan shows them the Laclede Gas Light Company has done everything possible to give them the service desired.

Target FOR TONIGHT

Tonight's target is *any spot in the world* where the American Command chooses to concentrate air power—thanks to miracles of organization and production. ★ Every member of the PAYNE organization is proud and grateful to have a small, yet vital part in supplying the weapons of Democracy. ★ PAYNE'S expanded facilities are now dedicated to this one end. But after the war, we shall be even better equipped to resume our nearly 30 years' leadership in the peaceful science of heating.

TARGET FOR TOMORROW

"Right on the target" of America's post-war expectations is the planning now taking place in PAYNE laboratories and drafting rooms. In the future, as always, PAYNE dealers will offer years-ahead design and performance.

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PAO 11 Supplementary Orders Issued

TWO supplementary orders to the general PAO No. 11, governing the spacing of shallow oil wells, have been released by the Petroleum Administration for War. These two new orders, No. 7 and No. 8, relate to specific areas in the oil-producing states.

Supplementary Order No. 7 affects spacing requirements for the drilling of shallow oil wells in 12 counties in southwestern Michigan. In these counties oil wells may be drilled or deepened to depths not greater than 2000 ft. on a basis of 20 acres per well, instead of the 40 acres per well required in the general terms of PAO No. 11. Wells complying with the 20-acre spacing requirement are eligible for priorities assistance in securing necessary materials without any application for an exception to PAO No. 11.

Supplementary Order No. 8 enumerates the provisions for the drilling of shallow oil wells in eastern Kansas, eastern and southern Oklahoma, and north and west central Texas. Under this order, materials may be used to drill and equip oil wells in the affected areas under the following conditions:

1. Five-acre spacing of oil wells completed at depths not exceeding 1200 ft.
2. Ten-acre spacing of oil wells completed at depths between 1200 and 2000 ft.
3. Twenty-acre spacing for oil wells completed at depths between 2000 and 3000 ft.
4. Forty-acre spacing for oil wells completed at depths greater than 3000 ft.
5. Pumping or artificial lift equipment may be installed on oil wells completed at depths not exceeding 1200 ft. provided that such installations do not exceed an average of one well to five productive acres.

The new Supplementary Order No. 8 applies only to oil wells and the existing restrictions on the use of material for drilling and completing gas wells remain unchanged. If, in the course of drilling operations under Supplementary Order No. 8, a gas well is obtained, application for an exception must be filed with the PAW district office before completion of a gas well.

■ ■

Scrap Iron "Blood Bank"

According to the business press industrial scrap committee, it is conservatively estimated that the steel industry will consume approximately two million net tons of purchased scrap each month this year, or a total of about 24 million net tons. This will be purchased scrap—scrap that must come from households, from automobile graveyards, from industrial plants, from farms and from the highways and byways of the nation.

The only insurance against a scrap iron shortage is a definite goal, a stockpile, or a scrap iron "blood bank" that must be achieved within a specific time.

Washington Notes

Utilities Order U-1-(a): This order covering materials used by electric, gas, water, and steam utilities, which come under the jurisdiction of the Office of War Utilities, was again amended May 31 (*GAS*, April, 1943, page 40). Principal change affecting the gas utility industry is the removal of gas chemical materials and supplies from the restriction imposed by paragraph f of the order which governs deliveries, inventory, and withdrawals.

Limitation Order (L-38): Purchase orders for maintenance and repair parts for industrial and commercial refrigerating and air conditioning equipment must bear preference ratings of AA-5 or higher, according to Limitation Order L-38 as amended May 28 by the War Production Board.

The rating previously required was AA-4 or higher. The present change is made to bring L-38 in line with the minimum preference ratings for repair and maintenance parts established by CMP Regulation No. 5 as amended May 14, 1943.

Stove Rationing: Rationing of stoves which was to have become effective June 15 (*GAS*, May, 1943, page 40) has been indefinitely delayed, according to general opinion.

■ ■

Employers Should Register Employee-Fathers with WMC

EMPLOYERS engaged in war production or in activities essential to support of the war effort, such as gas companies, should file with Selective Service local boards written evidence of their employment of registrants who maintain bona fide homes with children less than 18 years of age, born on or before Sept. 14, 1942, Selective Service Bureau of the War Manpower Commission has announced. Selective Service Form No. 42B, which is available at local board offices, should be used for this purpose.

The local board, it was pointed out, thus will be advised of the registrant's employment in an essential activity, and the employer will receive notice of reopening of the registrant's classification any time it is undertaken by the local board. The employer, after receiving such notification, will have opportunity to submit additional evidence of the essentiality of necessary men in his employ.

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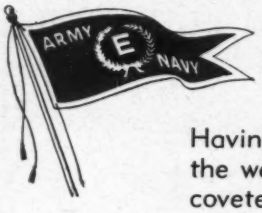

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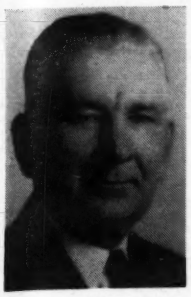
Oil Men Discuss Gas Conservation in Three States

PROPOSED measures for elimination of waste of natural gas in Rodessa oil and gas field in Texas, Louisiana and Arkansas were presented at the Tri-State Conference of Officials and Oil Men, held at Shreveport, La., on May 12.



Charles L. Orr

Gas from a number of the fields in the area already is being recycled or pumped back into oil reservoirs, according to E. G. Dahlgren, technical secretary of the research and coordinating committee of the Interstate Oil Compact Commission, who attended the conference.

Joseph L. McHugh, member of the Louisiana Conservation Commission, who presided at the conference, expressed the hope that a general program could be worked out whereby most of the gas that otherwise would be wasted will be pumped back into the production levels.

The Texas formula for uniform rules governing production of oil and gas in the area was strongly opposed before a joint hearing by officials of the three states and representatives of the Petroleum Administration for War during the meeting.

W. J. Murray, Jr., consulting engineer of the PAW, announced that some wells in the field were being operated at a gas-oil ratio of from 10,000 to 100,000 to one. He expressed the opinion that the problem could be solved by closing down the high ratio wells and utilizing the material in the field as an outlet for the remaining surplus gas.

W. H. Bell, director of the mineral division of the Louisiana conservation department, said that most of these wells had a market for their gas. He proposed as a possible basis for new regulations a field allotment based 35% on acreage and 65% on wells, and a 2000 to 1 gas-oil ratio. He believed that this might relieve the bottom-hole pressure.

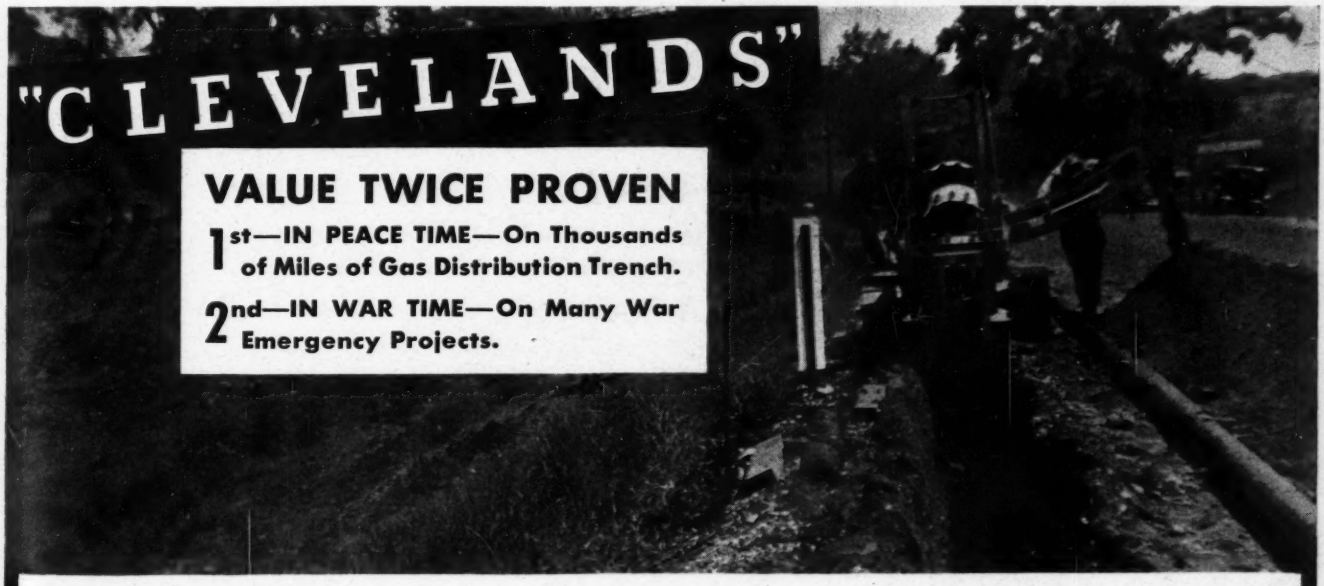
The Texas proposal, made following a recent hearing in Fort Worth, proposed to eliminate both the bottom-hole and acreage factors and substitute a 100% well allocation formula based on potential tests and reports and limited by the gas-oil ratio now in effect.

Officials of the three states were expected to confer later and take evidence at hearings in an effort to map out new orders for the field. The three states involved are members of the Interstate Oil Compact Commission, of which Charles L. Orr is secretary and E. G. Dahlgren technical secretary.

■ ■

FPC Approves Merger of South Carolina Concerns

The Federal Power Commission on June 3 announced its orders authorizing the merger and consolidation of facilities of the Lexington Water Power Co. into the South Carolina Electric & Gas Co., and approving the transfer of the license, as amended, issued to the Lexington company for a period extending from Aug. 5, 1927, to Aug. 4, 1977, covering the hydroelectric project on the Saluda river in Lexington, Richland, Newberry and Saluda counties, South Carolina. Both companies have their principal offices in Columbia, S. C., and both are controlled by the General Gas & Electric Corp., a subsidiary within the holding company system known as the Associated Gas & Electric Corp.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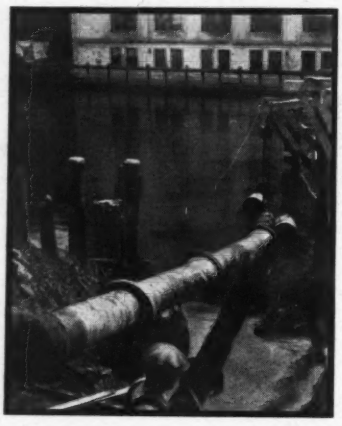

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WPB Approves New 26-in. Oklahoma Line

CONSTRUCTION of a new 26-in. gas pipeline by the Cities Service Gas Co., authorized in Washington on May 24 by the War Production Board, is expected to open a new era of development in the Texas County, Okla., district of the Hugoton gas field.

Although gas was discovered in the Oklahoma sector 10 years ago, the field has been handicapped by lack of a market. The 26-in. line will run from the center of Texas County, Okla., 240 miles eastward to the Cities Service system's connection at Blackwell, Okla. It will deliver up to 140,000,000 cu. ft. of gas daily from the Hugoton field in Oklahoma and Kansas. Neighboring systems in the two states will be given an opportunity to receive deliveries from the line. This supply of gas will more than replace the West Cement, Okla., field, closed to natural gas withdrawals on May 18 by the Oklahoma Corporation Commission at the request of PAW, to protect petroleum production in the field. Cities Service had been taking upward of 80,000,000 cu. ft. daily from this field.

An estimated 55,000 tons of steel will be required to complete the line, which should be ready for operation in December of this year.

It is expected that more wells will have to be drilled in the Oklahoma section of the field to supply the demand of the new pipeline. The Oklahoma Corporation Commission threw its support to the Cities Service Gas Co. application. Ray O. Weems, vice chairman, in a telegram to J. A. Krug, director of the Office of War Utilities of the WPB, pointed out that Oklahoma gas is needed for prosecution of the war and operation of war industries and asked PAW for relaxation of drilling restrictions in the Texas County sector of the field.

"Oklahoma has 31 connected wells and 29 unconnected wells in a common reservoir in the Hugoton gas field," Mr. Weems stated in his telegram. "Kansas has an excess of 300 connected and 27 unconnected wells in the same common source of supply. Kansas has nine pipelines, while Oklahoma has only one major and two minor lines," he stated.

The Consolidated Gas Utilities Corp. of Oklahoma City has an application pending before the WPB for permission to construct a 20-in. gas line from near the city of Hugoton, Kan., to the Cunningham field, where it would interconnect with the 12-in. line of the Cities Service Gas Co. If the Consolidated application had been granted, that company also would construct an 18-in. line from the Cunningham field to Wichita, Kan.

■ ■

U. G. I. Reorganization Plan Effective June 11

The United Gas Improvement Co.'s plan for the divestment of certain securities and other assets under the Public Utility Holding Company Act of 1935 was declared effective on June 11 by the board of directors of the company. This plan was filed with the Securities and Exchange Commission on Dec. 22, 1942, amended March 16, 1943, and finally approved by the SEC on March 18 of this year.

It is proposed that U. G. I. stockholders of record June 15, 1943, will be entitled to receive shares of the new common stock of Philadelphia Electric Co. and shares of the common stock of Public Service Corp. of New Jersey under the plan. The plan provides for distribution of shares on the basis of one-third of a share of new common stock of Philadelphia Electric and one-twelfth of a share of common stock of Public Service Corp. of New Jersey on account of each share of U. G. I. common stock. Non-voting bearer script will be issued in lieu of fractional shares.

Transfer books for the U. G. I. $5 dividend preferred stock were closed on June 11, and since that time such stock has no right but to receive, on surrender, for each share of $5 dividend preferred stock, three shares of the $1 dividend preference common stock of Philadelphia Electric Co. and $40.

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Gas Production Limited In Two East Texas Fields

A gas conservation order specifically limiting withdrawals from the Long Lake and Cayuga fields in East Texas to 5000 cu. ft. of gas per barrel of oil was passed late last month. Of this 5000 cu. ft., operators are required to arrange for diverting at least 3000 cu. ft. of the gas to legal uses, while the remaining 2000 cu. ft. may have other disposition. Gas reinjected into the formation from which it is produced is not considered to have been withdrawn and therefore need not be counted in complying with the new order.

In determining the gas limit for any well in the two fields, the daily current oil allowable provided for such well shall be multiplied by the gas-oil ration applicable under the terms of the new order, and no such well shall be permitted to produce an amount of oil daily which will cause the gas production to exceed the newly quoted limit.

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